

CROWN LANDS

APPLICATIONS FOR LAND.

Intending applicants for any lands which are open are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portion of a block, if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey.

ALLOTMENTS, SALES, TRANSFERS, SUBLEASES, AND MORTGAGES.

Notice is hereby given that in future no applications for land, or for transfer, sublease, or mortgage of Crown leases or agreements will be approved to unnaturalised persons of any nationality, or to naturalised persons of enemy origin unless the consent of the Honorable the Attorney-General of the Commonwealth be first obtained by the parties making the application.

Where any doubt as to nationality exists, it will be necessary for certificate of birth or naturalisation papers to be exhibited.

The same principle will apply to land sold by auction.

OFFICIAL LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which may be seen at the principal Post Offices, and copies obtained at the Office of the Secretary for Lands. The List shows the Areas, Localities, Prices, &c., of the Sections available and the conditions under which they may be applied for.

NOTICE TO APPLICANTS FOR LAND.

The Land Board meets daily (when necessary) at the Board's Office, Department of Lands, to deal with applications received the previous day for any lands that may be open in the Official List. Applicants must either attend personally or send a full-written statement. Forms can be obtained at Post Offices, or on application to the Secretary for Lands.

E. A. ANSTEY,

Commissioner of Crown Lands and Immigration.

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All communications to be addressed:

"The Editor, Journal of Agriculture, Victoria Square, Adelaide."

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E. A. ANSTEY,

Minister of Agriculture.

POINTS FOR PRODUCERS.

Statistics.

The average man prefers his medicine in small doses, the same may be said of his statistics. The second issue of "The Statesman's Pocket Year Book of South Australia," compiled by the Government Statist (Mr. W. L. Johnston) contains a great deal of useful statistical information in regard to South Australia, and it has the advantage of being compressed into a volume that will fit the vest pocket. Many interesting facts of historical importance are also included.

Weevil in Wheat.

The South Australian Wheat Scheme is making strenuous efforts to combat the weevil pest, and is endeavoring to enlist the co-operation of agriculturists in its endeavors to minimise destruction by the weevil. On page 864 of this issue will be found a copy of a communication which has been addressed to all Branches of the Agricultural Bureau by the supervisor of the Weevil Department of the Wheat Scheme (Mr. D. C. Winterbottom). Therein Mr. Winterbottom mentions a number of sources of infestation, and suggests measures that may be taken by farmers to protect their grain.

The Divining Rod.

The Society of Natural Sciences of Wageningen, Holland, organized experiments in order to test the value of the divining rod. Four diviners took part in the tests which consisted—(1) of tracing underground streams and controlling their courses in a given plot; (2) of determining whether underground conduits were full of water or dry. The results showed (says the *International Review of the Science and Practice of Agriculture*) that in many cases it was probable, and in some cases certain, that the rod did react to some apparently existent conditions. This shows the apparent success of diviners to be due to superficial control and their observation and experience of the ground. Completely unfavorable results were obtained in searching for predetermined water currents; correct answers were obtained in 23 cases, and wrong ones in 25. The results of the experiments were therefore in opposition to the claims of the diviners.

Where Stockowners Fail.

"What is the weak point in stock management in South Australia?" was a question recently submitted to the Government Veterinary Lecturer (Mr. F. E. Place), who unhesitatingly replied, "Ignorance of the balanced ration. This is evidenced by the great number of cases of trouble amongst all classes of stock that have been brought under my notice," he continued. "Deaths amongst sheep, dry bibles in cattle, stoppages in horses are all of them directly attributable to a want of appreciation of the fact that the diet needs to be sufficient and varied."

Linseed, White Mustard, and Sunflowers.

"Linseed, or flax, needs to be sown on soil of good quality, and particularly on soil not liable to drying off too suddenly in the early spring," says the Director of Agriculture in reply to a correspondent. "It should be sown on land fairly free from weeds; preferably, therefore, on land that has been treated as bare fallow in the preceding season. The seed-bed should be in a perfect condition of tilth at seeding time. The seed should be broadcasted at the rate of $1\frac{1}{2}$ bush. to 2 bush. to the acre, and lightly harrowed in. The grain ripens irregularly; you should not, therefore, wait for complete maturity to start harvesting. It is usual to start when about one-third of the height of the stem has changed from green to yellow, with the leaves over this portion of the stem more or less withered. At this stage the seed will be beginning to change color from green to brown. The usual method of harvesting for grain is to put the straw through a thrasher. You would probably secure good results by putting it through a stripper with the damp weather attachment, maintaining the stripper stationary and driving it by an engine. As to white mustard, it can be sown on any type of soil, and makes exceedingly rapid growth during the winter months. Although I have never harvested it for seed, I should imagine you could treat it somewhat similarly to the flax. The oil from sunflower seeds is extracted by pressure. I doubt much, however, that you could do this to any advantage on a farm. This oil is of very good quality, and commonly used in commerce.

Anaemia in Sheep.

A large number of cases of death amongst sheep have been reported during the last two months. Among the many causes to which the trouble has been attributed are stinkwort poisoning, stomach worms, &c. The Government Veterinary Lecturer has consistently recommended sheep owners to provide their flocks with salt and lime licks. It is very gratifying, therefore, to report that from various quarters intimations have been received that as soon as licks of this nature have been made accessible, fatalities have been avoided, and there is a marked improvement in the appearance of the sheep.

ALMONDS.

The question as to the most suitable variety of almonds to plant on light limestone soil, with plenty of subdrainage, was recently submitted by a correspondent. The opinion of the Horticultural Instructor (Mr. Geo. Quinn) was that the best almonds were Hatch's Nonpareil and I.X.L., representing the softer-shelled types, and Peerless and White Nonpareil the firmer-shelled sorts. The two first named bloom together, and later than the two last-named varieties, which are also well suited to cross fertilize each other.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

VETERINARY INQUIRIES.

During the month some 200 inquiries for information as to the cause and treatment of different classes of stock have been received. These have been replied to through the medium of the post.

ENTOMOLOGICAL INQUIRY.

"W.," Kangaroo Island. The Museum Entomologist (Mr. A. M. Lea) reports that the specimens forwarded are green blowflies (*Calliphora rufifacies*) whose hairy maggots are frequently found in blown wool.

HANDFEEDING SHEEP.

"L. G. B.," Coomandook, has a flock of 159 ewes with lambs from one week to a month old. He is giving them in two feeds daily about two bags of oats. He desired to know whether it is good practice to feed oats to the ewes.

In reply, the Director of Agriculture states:—I note that you are feeding your ewes with oats at the rate, roughly, of 1½ lbs. per day per head. This is by no means a heavy ration, but may be sufficient if there is an adequate supply of roughage for grazing purposes. You state that some of the ewes appear to refuse to eat the oats. I feel sure, however, if the oats are of good quality, and if you persevere, that there should be no difficulty in getting them to take oats. I certainly recommend feeding the ewes so long as green feed is insufficient for their maintenance. The value of your lambs will depend very largely on the extent to which you keep your ewes adequately fed. Unfortunately the mistake that is generally made is to put off hand-feeding till too late; the ewes should on no account be allowed to get too weak before artificial feeding is supplied to them.

TREATMENT OF LAND SOURED AND RENDERED UNPRODUCTIVE BY "SEEPAGE."

[By ARTHUR J. PERKINS, Director of Agriculture.]

The Berri Branch submitted as a subject for discussion the "Treatment of Land Soured and Rendered Unproductive by 'Seepage,'" and as personally I was at a loss for a suitable subject, I decided to take it over and deal with it to the best of my knowledge.

In the first place I shall state, that in my view this question has been somewhat unfortunately worded; in the connection in which it appears to have been used, I am inclined to question the appropriateness of the word "soured". I am of the opinion that this term soured should be reserved for those lands in which lime is practically absent, and which, for one reason or another, show an acid reaction. It will probably be agreed that other things being equal, land adequately stocked with lime is quite as liable to "seepage" troubles as land containing no lime at all; hence, it seems inadvisable to describe such lands as "soured."

Let us endeavor to trace back "seepage" troubles to initial causes. Superfluous water more or less charged with injurious saline matter, finds its way from adjoining areas, or from leaky irrigation channels, on more or less low-lying land. Under the influence of intense surface evaporation, this water slowly but persistently rises to the surface and disappears into the atmosphere in the shape of vapor, leaving behind it in the surface layers of soil, a gradually increasing mass of injurious saline matter. The usual result of these physical phenomena is, that existing vegetation gradually gives way, and in the course of time, and affected by "seepage" becomes to all intents and purposes barren; not necessarily because of any degree of natural acidity or sourness, but because of an undue accumulation of injurious salts in the surface layers of the soil, and because of an abnormal and more or less persistent rise of the underground water table.

What, in the circumstances, are we to do? Clearly, our first efforts should be directed towards determining with some degree of certainty the source of the trouble, and when we have satisfied ourselves on this point, we can proceed to weigh methods of defence. But to endeavor to reclaim land suffering from "seepage" without first having definitely ascertained the origin of the "seepage," would be mere waste of time and money.

If the trouble can be traced to the leakiness of a channel, we shall be aided with a purely local factor, and one which should, as a rule, offer little or no difficulty in the way of definite control. In most cases, however, the trouble is far more deep-seated, and not infrequently beyond the effective grasp of individual growers.

In a compact irrigation settlement, in which block after block, in regular series, come regularly under irrigation, it is quite impossible at individuals should remain altogether indifferent to the doings of

their neighbors. What is done light-heartedly on one block, will, at times make itself felt unexpectedly, and perhaps injuriously, on a neighboring block, and this applies with peculiar force to the misuse of irrigation waters.

Some two years back, at Murray Bridge, whilst dealing with the "salt" problem, I had occasion to point out that under arid or semi-arid conditions of climate, the use of more irrigation water than was absolutely necessary was always a source of extreme danger to the ultimate productiveness of irrigated land, and I shall add now, that the man who squanders irrigation water, is not only a danger to himself, but to his neighbors also; in other words, the misuse of irrigation water is the usual cause of most "seepage" troubles.

If we admit this to be the case, we are bound to recognise that until the main cause of the trouble is removed, and the "seepage" is definitely cut off, there is nothing useful that we can hope to realise in the direction of reclaiming land spoilt in this way.

It is a matter of some surprise to me, that in a newly-settled irrigation area, such as Berri, "seepage" troubles should already be making themselves felt. There is surely sufficient experience in the world today to show that under arid and semi-arid conditions of climate, any irrigation system with claims to efficiency, must be accompanied by an adequate drainage system. In laying out an irrigation settlement, the design of drainage channels is quite as important as the design of channels of supply. An effective drainage system will help to correct the errors of the man who will insist on over irrigating his land, at all events in so far as neighbors are concerned; hence, given effective drainage and watertight channels of supply, most "seepage" troubles would soon disappear.

In this connection, it may be as well to emphasize the fact that unless it can link up with a general drainage system, carefully and thoughtfully planned out, individual effort in the matter of drainage is bound to remain more or less powerless. Unless the whole irrigation settlement is afforded good drainage conditions it is only by a combination of accidentally fortunate circumstances that the individual settler can hope to get rid of his superfluous drainage waters.

Just as the main supply channels are made to follow at an adequate gradient, the higher levels of the land, so the main drainage channels should be made to follow the lower ones on a gradient sufficiently steep to lead to their rapid discharge into the country drainage.

I understand that in several of our river settlements hopes are entertained of discovering some magic layers of soil, into which all the local drainage waters might be emptied without fear. Such an expedient would not, perhaps, be altogether impossible, had we in view a limited area of ground and a limited period of time; but in the matter of large settlements, I fear, such hopes are wholly illusory. Our irrigation settlements are increasing in area from year to year, and the time will come when, if not in immediate contact, they will at all events be within sight and hearing of one another, and we trust that time will place no limits to their prosperity. In the circumstances, therefore,

even if we could discover some conveniently porous layers of soil, it is impossible to imagine that they can continue indefinitely to absorb all our surplus drainage waters. Rather, in my opinion, the ultimate effects of a policy of this kind would be to accentuate all our "seepage" troubles. In the course of time—more rapidly perhaps than we anticipate—these porous layers, if discovered and utilised, would gradually become more or less saturated with salt-impregnated drainage waters; and their resistance to the penetration of additional waters would slowly become greater and greater; a fact which a general rise in the underground water tables of the localities affected would soon bring home to us; and the natural consequence would be far more extended "seepage" troubles than we have yet had any experience of.

It follows that in my view, it is not under the earth that we should endeavor to hide our drainage water. In districts such as those traversed by a wide navigable river, it is the river itself that is the natural outlet for all local drainage water; and it is therefore towards the river that our superfluous drainage waters should be directed.

I take it, that when a new irrigation settlement is being designed, one of the first steps towards ultimate efficiency of design should embrace a system of drainage channels discharging ultimately into the river, and so disposed as to cut off, whenever required, the drainage waters of any individual block of the settlement. Where the natural gradient happens to be slight, it is conceivable that the main drainage channels may not be able to discharge their waters into the river with all necessary speed; when such is the case, the services of powerful pumps must be requisitioned, bearing in mind the fact that drainage channels are not supply channels, and that they cannot be looked upon as working efficiently unless kept consistently empty. If these drainage channels are allowed to stand full of stagnant, poisonous water, they become themselves a fruitful source of "seepage" troubles, more dangerous probably to the grower than the very troubles they are supposed to overcome.

It seems almost unnecessary to add that drainage work is not simple, straightforward work; that it involves engineering difficulties, the solution of which should be left to those competent by training to deal with them, and that laymen who dabble with drainage, frequently do more harm than good. In my view, the drainage system of every irrigation settlement should be carefully designed by a competent engineer, and similarly in every irrigation settlement of any importance, the efficient working of the drainage system should be under supervision and control of a competent engineer, whose advice should always be available to individual settlers having local drainage troubles of their own. Unless some such provision is made, I am confident that much time and money will be spent in vain.

Briefly, then, the position may be summarised as follows:—"Seepage" troubles are already making themselves felt in most of our settlements; and unless we make adequate provision to check them "seepage" areas will continue extending from year to year; and ultimately "seepage" troubles may lead to the ruin of our irrigation settlements. Even if we were to assume—which we cannot do—that

every settler is competent to deal with the drainage of his own block, unless there is already in existence a common drainage system, capable of dealing effectively with the drainage of a whole settlement, spasmodic individual efforts are bound to remain more or less without result. The position is hardly improved if we admit—as we must—the incompetency of the average individual settler to deal with local drainage problems. Hence, it appears to me that if we wish to forestall possible future disaster, the only course open to us is to place drainage matters in the hands of competent drainage engineers, and render them directly responsible for all future “seepage” troubles.

After an unavoidable diversion, we are now in a position to consider practices likely to lead to the ultimate reclaiming of land already spoilt by “seepage.” The first step, as has already been stated, is to seek out the root of the trouble; and when the latter has been found and checked, what follows is comparatively plain sailing. It should be observed, however, that for the cases we have in view, the mere cutting off of “seepage” waters from higher levels, does not necessarily put an end to drainage troubles. Even after these waters have been successfully cut off natural drainage conditions on land of this type will still continue more or less defective; and until we succeed in lowering the local underground water table, and restoring to this land good healthy drainage conditions, we cannot hope to recover it definitely for agricultural purposes. Hence, as a preliminary to any other action, I must assume that our land spoilt by “seepage” has been freed definitely from the stagnant underground waters which had previously reduced it to barrenness; and that drainage conditions are now such that any further accumulation of superfluous waters is highly improbable.

Our next step should concern the nature of the salts that have accumulated in the land. This involves no more than a comparatively simple chemical analysis. On the whole, in this connection, there are only two cases which we need take into consideration—(1) Black alkali, implying the presence of sodium carbonate in addition to other salts, and (2) white alkali, implying the presence of more or less complex saline substances, but the absence of sodium carbonate. In other words, independently of other salts, sodium carbonate is, or is not present.

Fortunately here in South Australia we have not hitherto been much troubled with black alkali in our irrigation settlements. Nevertheless, in cases of land affected with “seepage,” particularly of long standing, it would not be wise to take for granted the absence of sodium carbonate. Indeed, it should be pointed out that given the presence of sodium chloride on the one hand, and calcium carbonate on the other, the sodden conditions of land affected with “seepage” are such, as a rule, as to favor the gradual formation of sodium carbonate in the land.

If, therefore, the presence of sodium carbonate is recognised, a preliminary treatment with gypsum should precede all other action. The rate at which gypsum should be used, in this connection, will depend a good deal on circumstances, and chiefly on the quantity of sodium carbonate present in the soil. A concentration of 0.1 per cent. of sodium carbonate is said to be sufficient to interfere with the growth

most plants. If we suppose this concentration to extend over the first three inches of soil, it would represent about 800lbs. to the acre; which quantity should be neutralised roughly by a dressing of about 9cwts. of gypsum to the acre.

The gypsum, which is applied to the land in the state of a fine powder, can only react on the sodium carbonate if brought into contact with it by water. Hence, subsequent to the dressing of gypsum, the land must be flooded, and the flood waters, by passing slowly into the drainage system, will carry with them the sodium sulphate into which the carbonate will have been converted. It will be clear therefore, that no good results can be anticipated from this treatment, unless natural drainage conditions had been previously restored. In addition, the flood waters will also remove other soluble injurious salts present, such as the chlorides of sodium and magnesium, the sulphates of sodium and magnesium, &c.

If, as is more frequently the case, we have to deal with white alkali only, preliminary treatment with gypsum is unnecessary, and we can proceed immediately to flooding operations, which, as in the preceding case, will remove from the soil injurious salts soluble in water, and pass them on into the country drainage.

We may assume that if these operations are efficiently managed, the land will be thoroughly leached of its injurious soluble salts. As soon as the land is sufficiently dry for the purpose, the next most rational step would be to break it up to a good depth so as to expose the soil freely to the various atmospheric agencies. In this connection one should not be too anxious to break down the land rapidly into a fine condition of tilth; let it lie for some weeks, at all events, exposed to the air in its rough open state.

It is as well to recollect, at this stage, that the abnormal "seepage" conditions to which land of this character will have been subjected for more or less considerable period of time, will have had a very disturbing influence on those soil bacteria upon which soil fertility is very largely dependent. The healthy development of the latter is very closely connected with special soil conditions which are usually absent when "seepage" controls the situation; namely, good drainage, favorable aeration of the soil, suitable moisture and temperature conditions, the presence of organic matter, the absence of injurious salts inhibiting growth, &c. Briefly, continued "seepage" may destroy completely useful bacteria, and leave in their place lowly forms of life more or less hurtful to general soil fertility. Hence, a double line of treatment suggests itself as of probable usefulness; first, surface sterilisation, by means of an adequate dressing of recently slaked lime; and secondly, restocking with useful bacteria by an adequate dressing of good farmyard manure. Moreover, farmyard manure presents the additional advantage of bringing to this land a fair supply of organic matter so essential to the good development of most bacteria.

The lime should be applied at the rate of not less than 10cwts. to the acre, in the form of quick-lime slaked on the spot and for the purpose. It should be spread evenly over the rough soil surface, and subsequently

lightly harrowed in. Four to six weeks subsequently, the land should be dressed with farmyard manure, at the rate of, say, 10 tons to 12 tons to the acre. This manure should be ploughed under rapidly, but no deeper than is absolutely necessary; lighter dressings may be used if farm-yard manure is scarce.

If we assume this general treatment of the land to have taken place in the early autumn, say in March, the land in question should be in condition to take a first spring crop in the following August or September. I do not recommend sowing or planting it to perennials in the first season; rather place it under some rank-growing annual crop such as sorghum, millet, maize, &c., if the season be spring; or under a hay crop, berseem, &c., if the season be autumn. Subsequently to the successful growth of a couple of these crops in succession, the land may be considered to be fit for general purposes.

In the discussion that followed Mr. F. R. Arndt (Berri) asked the Director if he thought the salt connected with seepage could be traced to the natural limestone hills. He had tried an experiment by dissolving limestone in rainwater from a hill that had never been irrigated, and the result was that the water was quite salt. In replying the Director stated that there was no connection whatever between the limestone and the salt. It was purely a physical phenomenon. They were bound to have salt in those fairly dry districts, where the rainfall was not sufficient to wash it away. It was quite probable that underneath the limestone there was a layer of heavy soil that prevented the salt from leaching away. In reply to a question from Mr. Mills (Berri) as to what was the best substitute for farmyard manure, the Director stated that nothing was so effective as that class of manure. Whatever farmyard manure they could obtain they should spread evenly over the land. Green crops to be ploughed under would also be beneficial. Mr. G. W. Beverley (Pyap) related some experiences that he had had with shafts put down to carry away surplus waters. Some years ago he had sunk a shaft to a depth of 63ft., and it was still working most satisfactorily. The Director pointed out that that practice would no doubt serve for a few years, but if 1,000 shafts were sunk he did not think the plan would meet with so much success. Mr. Pomeroy (Lyrup) had been on the Lyrup settlements for a number of years and he had experienced no troubles from seepage. He was of the opinion that if the land were better cultivated and less water were applied seepage troubles would not be so evident. Mr. H. S. Taylor mentioned that Lyrup was on an alluvial flat. Mr. W. R. Lewis (Berri) had reclaimed a block that had been almost unworkable by keeping the water off for 12 months and by sinking a couple of shafts

THE BLOOD IS THE LIFE.

[By F. E. PLACE, B.Sc., B.V.Sc., M.R.C.V.S., Government Veterinary Lecturer.]

Back in the early ages a landslip or a flood resulted in a forest being hung with votive offerings to the demons; later a plague or epidemic was followed by altars in the temples.

To-day, if horses die, the mystery is discussed, water analysed, high-power microscopes brought to bear on possible germs, and a high-sounding name bestowed on the unknown.

Perhaps some observer in Mars has written a monograph, and described some of the customs of the earth crawlers as he has seen them; two days ago a black, naked savage painting his totem in the jungle; yesterday a cassocked priest decking his altar in the shrine; to-day a linen-shrouded bacteriologist incubating his cultures, and the Martian pens a footnote, "Seeking the unknown."

What is known to the South Australian farmer is that his horse fails to swallow properly, grows stiff, loses the power of his hindquarters, and dies, or, after an infinity of trouble, survives, a wreck of his former self. And not one and one, but groups of eight or nine; and for a time the ineptitude of veterinary science to suggest a remedy is scoffed at, deplored, and forgotten. The occurrence is only marked when a dispute as to age is settled by the fact that the foal was dropped the year Farmer Jones's horses died, or when a Government veterinary made a post-mortem on Farmer Smith's two mares that dropped in harness.

Eight years ago we were told the disease was cerebro spinal meningitis, till a doubter pointed out that there was no inflammation of either brain or spinal cord, or the membranes that cover them. He did notice, however, that the condition of the blood was anaemic, and suggested arsenic and quinine as remedies. They worked, and the disease was rechristened toxæmic paralysis, and considerable discussion arose as to whether it was infectious or not, and as to how the germ was carried, and what part bloodworms or mice might play. And the doubter weighed the evidence as it came to hand, still being struck by the persistence of anaemic changes, and, in spite of opposition, added blood letting to the administration of drugs, with success; human surgeons do it, too, in anaemia. And then the doubter pointed out that food which used more energy to be digested than strength obtained was a considerable factor in the cause of the disease, only to be rebuffed by the fact that often horses sensibly fed would succumb, but only when mouldy, mouse-stained hay was part of their ration; so that when mice were much in evidence the trouble was called mouse disease.

The question to be settled at this stage was that of infectivity, and experiments prove that it can be transmitted in two ways, directly and certainly by inoculation with blood serum that has passed through a filter too fine to allow any known germ to traverse it. And indirectly,

and with less certainty, but with sufficient frequency to have a very practical bearing on the elimination of the disease, by the use of feed, especially hay or straw, fouled with the urine of affected animals, either mice or horses. Such a disease is said to be due to an ultra-visible virus. Many are known—human smallpox is an example; and the doubter is fain to admit that there is sufficient evidence to justify the name infectious anaemia.

The purely anaemic treatment of arsenic, quinine, and bleeding has been successfully assisted by the injections of bile or sodium citrate in the hands of qualified veterinary surgeons, but is beyond the range of the amateur, who would only increase the death roll by meddling with such methods. But what does stand out as the result of recent investigations as being quite within the power of the stockowner is to study the importance of balanced rations, as set out in a leaflet by the Director of Agriculture; to eliminate the South Australian method of allowing dung to accumulate in the stable yard as an absorbent of urine, which is the chief vehicle of infection. Doubtless many a horse that to the untrained eye has nothing wrong with him is a means of spreading the virus, especially to others whose depraved appetite leads them to eat dung, because they need variety that chaff does not supply, and whose weakened frames give ready homes to such poison; and, thirdly, to realise that it is the very poorest economy to feed foul fodder to horses or stock of any sort. A man with a motor car turns down an inferior brand of petrol, and yet orders muck to be chaffed for his team. Has he any right to blame a veterinary surgeon who cannot show him an ultra-visible virus?

EXPERIMENTAL FARM HARVEST REPORTS.

VEITCH'S WELL EXPERIMENTAL FARM.

[By W. J. SPAFFORD, Superintendent of Experimental Work, and
L. SMITH, Manager.]

This farm is situated in the hundred of Allen, 158 miles from Adelaide, on the Loxton Railway. It contains 3,800 acres of land, the bulk of which is sandy, the remainder running to shallow light loam soils overlying hard limestone rock—conditions similar to thousands of acres of surrounding country.

THE SEASON 1917.

The season opened with the usual small amount of rain for January, but the next month produced over 2½ in., being a good deal more than double the ordinary fall for February. This rain consolidated the fallows and germinated many of the weeds, thus giving us a chance to clean the land. March and April gave but little rain, and the amount was so small in the latter month that seeding operations were considerably delayed, which was possibly for the best, because mice were very thick in the fields, and did a good deal of damage to the early-sown wheat. Each of the next three months yielded about average rainfall, but in the spring months, August to October, exceptionally good rains for the district were registered, totalling 6.30 in., as against an average for the period of 4.35 in. Both November and December exceeded the average for those particular months. Despite the fact that the seeding rains were poor, the season suited the local conditions, the really good spring and summer rains quite making up for the deficiency in the earlier part of the year. The total rain that fell—16.60 in.—is a full 3 in. in excess of the average for the farm. The table following sets out in detail the rainfall registered at this farm since 1909:—

Rainfall Distribution at Veitch's Well, 1909-1917.

	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	Means 1909- 1917.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
January	0.56	0.26	0.84	—	0.10	0.31	0.48	0.18	0.45	0.35
February	0.19	0.32	3.17	0.29	2.67	0.56	—	0.03	2.60	1.09
March	0.66	4.78	0.65	0.30	3.22	1.06	—	0.10	0.78	1.28
April	0.15	—	0.03	0.18	0.14	1.01	0.51	0.20	0.24	0.27
May	3.03	2.16	1.32	—	1.23	0.52	1.33	0.43	1.15	1.24
June	2.48	2.09	0.90	3.95	—	0.35	1.91	1.97	1.01	1.63
July	1.73	1.41	1.11	1.09	0.53	0.38	0.63	2.43	1.14	1.16
August	2.24	0.58	0.66	1.25	0.67	—	1.67	4.01	1.91	1.44
September ...	1.78	2.34	2.13	1.33	3.22	0.15	1.99	2.57	2.01	1.95
October	0.56	0.88	0.36	0.34	1.80	0.15	0.56	1.64	2.38	0.96
November	1.07	0.69	0.77	2.05	0.68	1.10	0.19	2.04	1.72	1.15
December.....	—	0.68	1.42	0.79	0.69	0.65	0.56	1.09	1.21	0.78
Total.....	14.45	16.19	13.36	11.57	14.95	6.24	9.83	16.69	16.60	13.32
Total "Useful" Rain (April to November)...	13.04	10.15	7.28	10.19	8.27	3.66	8.79	15.29	11.56	9.80

"USEFUL" RAINFALL AND ITS DISTRIBUTION.

It is a fact of common knowledge that it is not the total rain that falls during a year so much as the distribution of that rain which determines what the cereal crops shall be. To be able to see clearly what

the distribution of the rain was it is necessary to divide the time that the crops are growing into periods which we know by experience play a very important part in the crop growth. The table below sets out clearly what was the distribution of the "useful" rainfall for the past season:—

Distribution of "Useful" Rainfall in 1917 comparatively with the Means from 1909-1917.

	1917.	Means. 1909-1917.
	In.	In.
Seeding rains (April-May)	1.39	1.51
Winter rains (June-July)	2.15	2.79
Spring rains (August-October)	6.30	4.35
Early summer rains (November)	1.72	1.15
Total "useful" rainfall	11.56	9.80

This table shows the seeding rains to be low both for this year and on the average, and this lack of rain at the seeding period is certainly a big weakness in such a district, where crops tend to come to maturity very early in the year. The winter rains are a little below the average for the period, but the deficiency is more than made up during the remainder of the period. Although the total rainfall for the year was more than 3in. in excess of the average for the farm, the "useful" rainfall was but 1½in. in excess of the average "useful" rains, but still the fairly good distribution of these rains tended towards good crops, and the yields to be found below are quite satisfactory.

CROPS.

We are still not in a position to grow many crops other than the cereals, and so for this year again we can but submit returns from crops belonging to this class.

Green Forage Crops.—This farm is not sufficiently well subdivided to allow us to grow many green forage crops, but this year a block of about 20 acres on the east side of Field No. 4, which carried Cape barley in 1916, was cultivated up and sown with mixed wheats at the rate of 2bush. of seed to the acre, with 2cwts. superphosphate. This wheat, with the self-sown barley, provided much good fodder throughout the growing period.

Hay Crops.—Only a comparatively small area was sown particularly for hay, as we were depending on cutting wide headlands from the grain crops to make good this year's supplies. The east side of Field No. 2 carried a wheat crop in 1915, and was ploughed from August 7th to August 30th, 1916, and kept worked until seeding. About 30 acres of this block was sown for hay with Baroota Wouder

wheat from May 18th to May 23rd, at the rate of 60lbs. seed, with 1cwt. superphosphate, to the acre. This block and the headlands cut totalled an area of 69.01 acres for hay, and produced 110 tons for an average of 1 ton 11cwt. 98lbs. to the acre. The returns secured since 1910, with the means for the period 1910-1917, are to be seen in the table below:—

Hay Returns, Veitch's Well, 1910-1917.

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.			Yield per Acre.		
	In.	In.		T.	C.	L.	T.	C.	L.
1910	16.19	10.15	82.00	82	0	0	1	0	0
1911	13.36	7.28	121.50	74	18	0	0	12	37
1912	11.57	10.19	218.00	109	0	0	0	10	0
1913	14.95	8.27	140.00	70	0	0	0	10	0
1914	6.24	3.66	100.00	Total failure.					
1915	9.83	8.79	158.00	180	0	0	1	2	88
1916	16.69	15.29	129.51	243	0	0	1	18	27
1917	16.60	11.56	69.01	110	0	0	1	11	98
Means	13.18	9.40	—	—	—	—	0	18	17

Oat Crops.—Oat crops have not been extensively grown on this farm, but this year the two standard hardy varieties, Algerian and Calcutta, as well as Scotch Grey (a variety that is proving itself a good grain-producer in limestone conditions); were grown. The part of Field No. 2 that carried some of the Algerian oats had a wheat crop in 1915, was ploughed during August, 1916, and worked as bare fallow until seeding, and on May 27th-28th about 13 acres were drilled in with 50lbs. of seed and 1cwt. superphosphate to the acre. The portion of Field No. 3 sown to oats had carried a hay crop in 1915, was ploughed in September, 1916, and worked until seeding. On May 9th about 13 acres were drilled in with Scotch Grey, on May 10th-11th about 22 acres to Calcutta, and on May 12th about 12 acres to Algerian Oats, using in each case 50lbs. seed and 1cwt. superphosphate to the acre. The returns secured from the various blocks are set out below, together with the farm average for the year:—

Oat Variety Yields, Veitch's Well, 1917.

Variety.	Field Grown.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Algerian	No. 3	1.15	35 12	30 28
Algerian	No. 3	10.62	309 36	29 7
Scotch Grey	No. 3	13.05	363 31	27 35
Algerian	No. 2	12.64	343 25	27 7
Calcutta	No. 3	12.73	344 11	27 2
Farm average	—	50.19	1,396 35	27 33

These returns are very satisfactory for conditions such as prevail at Veitch's Well, but are a long way short of that obtained from the small block harvested in the previous year. A return of nearly 28bush. to the acre, as compared with the 15bush. of wheat obtained, is much in favor of the oats from a profit-making point of view; but it remains to be seen how this crop will behave in the years of low rainfall, when they return. The returns obtained from this crop for the past two years, with the mean for the period, is to be seen in the next table:—

Oat Returns, Veitch's Well, 1916-1917.

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield. Bush. lbs.	Grain per Acre. Bush. lbs.
	In.	In.			
1916	16.69	15.29	12.39	478 37	38 26
1917	16.60	11.56	50.19	1,396 35	27 33
Means	16.64	13.42	—	—	33 9

Barley Crops.—We have only tried the six-rowed barley at this farm, and this season ordinary Cape barley and Short Head were the only two tested. The Short Head gave the very respectable return of 31bush. to the acre, but the Cape brought the farm average down. Below are set out the returns secured for this year:—

Barley Yields, Veitch's Well, 1917.

Variety.	Field Grown.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Short Head	No. 3	7.91	245 11	31 0
Cape	No. 2	36.12	858 49	23 39
Farm average	—	44.03	1,104 10	25 4

The return shown above is a very profitable one where cultivation is as cheap as at Veitch; but, of course, the season was a favorable one. There seems to be no reason, however, why the average of the farm for this crop cannot be kept at somewhere near 20bush. to the acre when the most suitable varieties are found, for the crop will produce returns on less rainfall than will wheat, and a 20bush. average in these conditions will be very profitable. In the following table will be found the returns of barley since 1915:—

Barley Returns, Veitch's Well, 1915-1917.

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
	In.	In.			
1915	9.83	8.79	22.72	248 91	10 46
1916	16.69	15.29	20.10	517 20	25 37
1917	16.60	11.56	44.03	1,104 10	25 4
Means	14.37	11.88	—	—	20 29

Rye Crops.—Only very small areas of rye have been grown here, and mainly with the object of having some good thatching straw on hand in case this should be needed. For the past two seasons the crop has behaved as a grain producer, as is shown below:—

Rye Returns, Veitch's Well, 1916-1917.

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
	In.	In.			
1916	16.69	15.29	0.36	3 12	8 53
1917	16.60	11.56	5.98	71 16	11 55
Means	16.64	13.42	—	—	10 24

Wheat Crops.—As with all of our experimental farms, at Veitch's Well we are endeavoring to discover the varieties most suitable to the particular conditions, and also to produce good seed for supplying to farmers similarly situated. This work necessitates the growing of a comparatively large assortment of varieties, many of which ultimately prove unsuccessful, and their presence keeps down the yields of grain secured. The varieties this year were grown in five different blocks, which received the following treatments:—

Field No. 1.—This block was only rolled and burnt in 1914, and carried a wheat crop in 1915; it was ploughed from August 10th to September 9th, 1916, and treated as bare fallow until seeding time. From May 30th to June 8th about 65 acres were drilled with Federation Wheat, and about 25 acres to Yandilla King, in each case 60lbs. seed and 1cwt. superphosphate to the acre being used. The mice were so very plentiful in this field, and did so much damage to the seed, that the germination was very poor, and to secure a crop it was necessary to re-seed the whole block. This was done by drilling, from July 23rd to July 26th, Gluyas on about 65 acres and Baroota Wonder on about 25 acres, at the rate of 30lbs. seed to the acre, without any extra manure. The returns secured—about 10bush. to the acre—are quite satisfactory considering the late reseedling, and are much in excess of what would have been reaped if the extremely thin crop had been left.

Field No. 2, West.—A wheat crop was grown on this block in 1915; it was ploughed from June 7th to July 25th, 1916, and then kept as bare fallow until seeding time. From June 9th to June 20th Federation on 25 acres, Yandilla King on 15 acres, and Silver Baart on 15 acres, were drilled in at the rate of 60lbs. seed, with 1cwt. superphosphate. This block, like No. 1, was badly infested with mice, and the grain suffered to such an extent that resowing was necessary, and was done from July 17th to July 21st, by drilling in about 25 acres of

Gluyas and 30 acres Baroota Wonder, at 30lbs. seed per acre, without extra fertilizer. The block returned nearly 10bush. to the acre.

Field No. 2, East.—The block, containing about 80 acres, carried wheat in 1915, was fallowed from August 7th to August 30th, 1916, and worked until seeding. Part of block was sown to oats and part for hay, leaving about 33 acres for wheat crops. Of this about 18 acres were sown to Baroota Wonder and 15 acres to Silver Baart, between May 18th and May 23rd, at the rate of 60lbs. seed with lewt. superphosphate to the acre.

Field No. 3, East.—Hay crops—wheat and oats—were carried in 1915 by this block, it was ploughed from September 1st to September 30th, 1916, and seeded to wheat and oat varieties in 1917. The wheats were drilled in from April 30th to May 12th, in all cases using 60lbs. seed and lewt. superphosphate to the acre.

Field No. 3, West.—This block grew a wheat crop in 1915, was ploughed from June 7th to July 25th, 1916, and seeded with wheat, oats, barley, and rye. Wheats were seeded from May 18th to May 29th, by drilling in at the rate of 60lbs. seed and lewt. superphosphate to the acre.

The yields obtained from the various wheat varieties grown, together with the farm average, are set out in the next table:—

Wheat Variety Yields, Veitch's Well, 1917.

Variety.	Field Grown.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Triumph	No. 3, East	3.09	76 34	24 47
Marshall's No. 3	No. 3, East	3.63	82 53	23 7
Walker's Wonder	No. 3, East	21.74	467 24	21 30
Red Russian	No. 3, East	14.59	297 35	20 24
Federation	No. 3, East	8.73	170 19	19 31
Late Gluyas	No. 3, West	38.42	700 7	18 13
Yandilla King	No. 3, East	10.25	184 51	18 2
Cumberland	No. 3, East	12.54	225 35	17 59
Gluyas	No. 3, West	36.23	642 18	17 44
Queen Fan	No. 3, West	35.10	588 22	16 46
Bearded Gluyas	No. 3, West	41.61	690 9	16 35
Silver Baart	No. 2, East	14.65	237 53	16 14
Baroota Wonder	No. 2, East	18.20	278 13	15 17
King's Red	No. 3, West	30.99	472 18	15 14
College Eclipse	No. 3, West	33.68	490 50	14 34
Mixture (resown)	No. 1	86.81	860 47	9 55
Mixture (resown)	No. 2, West	47.09	457 30	9 43
Silver Baart	No. 3, East	4.44	39 12	8 50
Baroota Wonder (exp.)	—	8.12	193 0	23 46
Farm average	—	469.91	7,156 50	15 14

The average for the farm—15bush. 14lbs.—is a fair one for the conditions of the district, particularly when so many varieties are grown; but it would have been considerably higher but for the ravages of the mice at seeding time. This is evidenced by the great difference shown between the yields obtained from unattacked crops and those that had to be resown. The next table gives the farm wheat averages since 1909, with the means for the period:—

Wheat Returns, Veitch's Well, 1909-1917.

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.	Yield per Acre. Bush. lbs.
	In.	In.		Bush. lbs.	
1909	14.45	13.04	22.00	396 0	18 0
1910	16.19	10.15	197.50	2,156 0	10 55
1911	13.36	7.28	620.90	5,080 30	8 11
1912	11.57	10.19	569.00	5,544 18	9 45
1913	14.95	8.27	791.40	4,742 28	6 0
1914	6.24	3.66	951.00	325 30	0 21
1915	9.83	8.79	602.11	6,681 51	11 6
1916	13.69	15.29	407.74	7,102 20	17 25
1917	16.60	11.56	469.91	7,156 50	15 14
Means	13.32	9.80	—	—	10 46

The returns from individual wheat varieties at this farm, comparatively to the general farm average for the separate years, are shown below:—

Yields of Varieties of Wheats, Veitch's Well, 1910-1917.

Variety.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	Means 1910-1917.
	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.
Baroota Wonder	24 0	7 55	8 29	8 27	1 18	12 43	16 20	17 54	12 8
Yandilla King	21 0	6 0	9 14	9 6	Failure	10 2	21 8	18 2	11 49
Federation	16 41	8 16	10 53	5 48	0 1	6 48	25 33	19 31	11 41
Cumberland	14 27	9 23	11 5	6 15	0 7	7 51	16 26	17 59	10 27
King's Early	15 0	7 5	9 38	4 26	Failure	13 26	16 9	15 14	10 7
Silver Baart	9 30	8 9	8 8	6 41	0 19	9 48	14 13	14 31	8 55
Walker's Wonder	—	—	—	—	—	—	18 41	21 30	—
Queen Fan	—	—	—	—	—	—	22 56	16 46	—
Late Gluyas	—	—	—	—	—	—	17 53	18 13	—
College Eclipse	—	—	—	—	—	—	20 18	14 34	—
Gluyas	—	6 56	9 54	5 4	—	—	16 54	17 44	—
Red Russian	—	—	—	—	—	—	13 12	20 24	—
Bearded Gluyas	—	—	—	—	—	—	13 57	16 35	—
Triumph	—	—	—	—	—	—	—	24 47	—
Marshall's No. 3	—	—	—	—	—	—	—	23 7	—
Farm average	10 55	8 11	9 45	6 0	0 21	11 6	17 25*	15 14	9 52
Rainfall	In. 16.19	In. 13.36	In. 11.57	In. 14.95	In. 6.24	In. 9.83	In. 16.69	In. 16.60	In. 13.18

EXPERIMENTAL PLOTS.

For the past three seasons quantitative manurial and rate-of-seeding tests with wheat have been conducted, the same amounts of manure or seed for the various plots each year being used, so that the results obtained can be tabulated together, and means for the various plots for the various seasons calculated. These results are to be found in the next two tables:—

Quantitative Fertilizer Tests, Veitch's Well, 1915-1917.
(Tests on wheat sown at rate of 60lbs. per acre.)

Fertilizer per Acre.	1915. Bush. lbs.	1916. Bush. lbs.	1917. Bush. lbs.	Means 1915-1917. Bush. lbs.
No manure	11 52	13 39	20 47	15 13
½wt. superphosphate	13 15	17 7	23 48	18 3
¾wt. superphosphate	—	17 40	23 49	—
1wt. superphosphate	13 43	18 49	25 30	19 21
2cwts. superphosphate	13 40	18 32	21 17	17 50
3cwts. superphosphate	13 19	21 31	25 15	20 2
Farm average	11 6	17 25	15 14	14 35
Rainfall	9.83in.	16.69in.	16.60in.	14.37in.

Quantitative Seed Tests, Veitch's Well, 1915-1917.

* (Tests on wheat sown with 1wt. superphosphate per acre.)

Seed per Acre.	1915. Bush. lbs.	1916. Bush. lbs.	1917. Bush. lbs.	Means 1915-1917. Bush. lbs.
30lbs. wheat	9 47	18 9	22 53	16 56
45lbs. wheat	10 9	19 1	23 42	17 37
60lbs. wheat	10 45	19 5	23 56	17 55
80lbs. wheat	9 57	18 39	26 31	18 22
Farm average	11 6	17 25	15 14	14 35
Rainfall	9.83in.	16.69in.	16.60in.	14.37in.

Baroota Wonder wheat used in both sets of experiments in 1917.

STATISTICS.—CEREAL AND HAY CROPS, 1917-1918.

The preliminary results of the recent cereal harvest have now been issued by the Government Statist (Mr. W. L. Johnston), who points out that the annual collection of cereal, dairying, pastoral, horticultural, &c., statistics by the police visiting the holdings will not be made until July and August. Special arrangements, however, were made to collect preliminary particulars of the cereal and hay crops through the post, and it is not anticipated that the annual collection referred to will materially revise the results now issued. For the purposes of the present estimate, forms were supplied to 15,786 farmers, and replies received from 14,869, the results for the balance of 917 outstanding having been estimated. Of the total number, 14,329 grew wheat, 3,720 barley, and 6,530 oats.

WHEAT.

In the case of wheat, 2,665,497 (3,112,479) acres were sown for grain and hay, a decrease of 446,982 acres as compared with the previous season. The area was distributed as follows:—Grain, 2,355,682 acres; hay, 292,803 acres. These areas include all crops and portions of crops which failed. The advices from farmers indicate that fully 106,160 acres totally failed and 17,012 acres were fed off.

It is estimated that 28,692,594 (45,745,064) bushels of wheat were reaped, a decrease of 17,052,470bush. on the record year preceding. The average per acre, 12·18 (16·46) bushels, though 4·28bush. lower than last season, is 1·72bush. greater than the average (10·46bush.) of the previous 10 seasons.

HAY.

The cut of hay, 354,400 (436,813) tons, with an average of 1·21 tons per acre, is considerably below the average cut, owing probably to the luxuriant growth of natural feed in many localities and fear of the ravages of mice.

BARLEY.

The total yield of barley, 1,585,556bush., with an average of 16·72bush. per acre, showed a decrease of 148,864bush. on the record season 1916-17. Of the total yield, 1,260,588bush. were returned as malting.

OATS.

1,291,342bush. were harvested, averaging 12·27bush. per acre, a decrease of 548,199bush. in the total yield, but an increase of ·14bush. per acre on the average yield of the previous season. The crop, however, was only 15,302 bushels less than the average of the previous 10 seasons. The cut of oaten hay, 113,498 (163,243) tons, averaged 1·05 tons per acre, a decrease of 49,745 tons, or ·05 tons per acre on the previous season.

GENERAL.

The exceptionally heavy and continuous winter rains restricted the area sown, but the harvesting weather was generally reported as most favorable.

PRELIMINARY RESULTS OF THE WHEAT HARVEST, 1917-18.

Wheat, 28,692,594 bush., 12-18 average; hay, 354,400 tons, 1-21 average.

County and Division.	GRAIN.				HAY.	
	Final, 1916-17.	Preliminary, 1917-18.	Average per Acre.		Final, 1916-17.	Preliminary, 1917-18.
			1916-17.	1917-18.		
	Bush.	Bush.	Bush.	Bush.	Tons.	Tons.
CENTRAL—						
Adelaide	872,423	214,629	17-87	12-58		
Albert	1,490,249	832,395	11-61	7-84	48,404	44,063
Alfred	1,718,265	1,128,183	13-95	10-97	11,502	8,347
Eyre	1,326,798	892,711	16-30	12-10	15,744	10,004
Fergusson	3,091,297	1,909,275	19-68	13-80	14,706	9,347
Gawler	2,759,074	1,878,424	19-40	14-61	10,710	10,422
Light	1,772,869	1,504,171	16-70	14-02	38,461	35,599
Sturt	1,208,580	637,391	15-22	10-05	52,200	31,761
Other Counties	293,167	179,105	16-08	9-91	15,248	10,861
Total	13,967,722	9,171,284	16-40	11-99	212,631	167,452
LOWER NORTH—						
Burra	712,896	641,147	21-19	18-62	6,844	5,062
Daly	5,298,799	3,466,678	19-32	14-79	28,040	20,374
Kimberley	289,249	165,332	21-05	13-81	2,256	1,336
Stanley	5,027,941	3,677,450	20-15	16-87	39,590	41,423
Victoria	4,239,199	3,284,505	20-94	18-15	49,899	41,831
Other Counties	112,123	50,361	9-56	5-53	2,278	1,201
Total	15,680,207	11,074,473	19-07	16-36	128,707	120,467
UPPER NORTH—						
Dalhousie	1,920,461	1,806,349	19-94	15-22	17,907	13,459
Frome	2,760,926	1,765,995	18-37	15-23	26,710	19,010
Hanson	275,750	136,829	16-92	8-61	2,684	1,046
Newcastle	514,641	251,344	17-84	12-27	6,235	2,844
Other Counties	447,316	260,363	15-36	10-48	3,068	1,444
Total	5,919,094	3,720,980	18-45	14-15	56,563	37,774
SOUTH-EASTERN—						
Buccleuch	841,823	507,259	8-62	6-65	2,893	2,612
Buckingham	567,480	245,606	13-70	7-21	922	678
Chandos	1,786,300	1,096,105	13-53	10-14	5,460	2,692
Russell	320,901	176,637	9-65	6-13	2,658	2,073
Other Counties	441,522	110,449	13-02	6-72	2,068	2,638
Total	3,958,026	2,145,056	11-70	8-09	14,001	10,734
WESTERN—						
Dufferin	343,423	171,575	14-55	8-35	984	89
Flinders	689,324	291,901	11-57	6-13	1,615	2,137
Hopetoun	250,788	63,193	14-11	5-08	856	49
Jervois	1,734,538	694,794	12-41	5-89	6,410	5,84
Kintore	320,349	82,343	11-89	4-72	1,626	1,30
Musgrave	292,828	209,646	10-36	8-03	1,604	2,85
Robinson	607,046	359,135	12-71	6-88	3,621	1,53
Way	1,369,073	319,001	14-80	5-25	5,044	3,16
Other Counties	352,546	359,163	16-41	12-87	2,940	
Total	6,220,015	2,580,801	12-90	6-68	24,611	17,88
GRAND TOTAL	45,745,064	28,692,594	16-46	12-18	486,813	354,400
Increase	—	—17,052,470	—	—4-28	—	—82,41

PRELIMINARY RESULTS OF HARVEST, 1917-18.

Barley, 1,585,556bush. (average 16.72; oats, 1,291,342bush. (average 12.27); oaten hay, 113,498 tons (average 1.05).

County and Division.	BARLEY.				OATS.		
	Malting.	All Other.	Total.	Average per Acre.	Grain.		Oaten Hay.
					Total.	Average per Acre.	
	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Tons.
STRAL—							
Adelaide	90,744	11,730	102,474	19.28	24,012	17.85	8,361
Albert	132	2,463	2,595	9.94	31,287	11.52	1,385
Alfred	2,115	4,140	6,255	13.45	21,542	15.98	619
Carnarvon	85,470	2,244	87,714	14.20	4,071	7.57	1,186
Eyre	1,321	5,393	7,714	14.39	12,580	17.17	87
Fergusson	495,376	60,594	556,470	16.57	140,574	12.21	14,726
Gawler	105,447	61,838	167,485	20.31	39,318	15.90	10,328
Hindmarsh	11,571	8,890	20,461	9.55	49,878	15.40	3,295
Licht	27,603	50,441	78,044	20.20	41,108	17.30	5,928
Sturt	7,290	8,240	15,539	10.90	42,850	11.49	1,577
Total	828,378	216,468	1,044,841	16.84	407,234	13.55	47,398
WEST NORTH—							
Daly	30,346	16,224	46,570	15.35	91,058	14.54	10,559
Stanley	15,458	26,639	42,097	20.28	58,870	18.02	3,110
Victoria	11,478	10,422	21,900	19.78	31,687	17.85	2,316
Other Counties	616	4,413	5,029	25.92	6,150	15.69	403
Total	57,898	57,698	115,596	18.03	182,760	16.00	16,388
WEST NORTH	876	3,729	4,605	16.10	14,154	18.43	530
UTH-EASTERN—							
Buccleuch	3,657	3,299	6,956	7.34	81,773	8.34	5,416
Buckingham	960	1,800	2,860	6.75	24,222	10.99	3,382
Cardwell	480	768	1,248	9.04	2,352	9.28	760
Chandos	7,874	5,279	13,153	9.31	233,700	15.37	7,892
Grey	290,148	15,093	305,241	28.80	70,019	16.34	13,140
MacDonnell	3,711	1,656	5,367	11.11	4,038	9.87	1,433
Robe	1,494	267	1,761	4.62	3,468	6.59	1,903
Russell	2,374	5,897	8,271	9.06	22,625	10.29	2,807
Total	310,698	84,149	344,847	19.68	442,797	12.67	36,228
EASTERN—							
Flinders	49,391	4,917	54,308	8.27	89,184	9.14	5,509
Jervois	1,578	2,423	4,006	12.60	93,857	7.62	3,990
Kintore	2,370	81	2,451	8.82	6,231	13.12	87
Musgrave	1,557	1,458	3,015	11.38	19,489	8.35	1,632
Robinson	5,361	1,563	6,924	10.82	11,858	9.26	264
Way	1,218	1,329	2,547	10.27	9,222	9.90	698
Other Counties	1,268	1,153	2,416	10.74	14,556	15.88	779
Total	62,788	12,929	75,667	8.83	244,397	8.72	12,959
LAND TOTAL, 1917-18 ..	1,260,588	324,968	1,585,556	16.72	1,291,342	12.27	113,498
LAND TOTAL, 1916-17 ..	1,340,302	394,118	1,734,420	16.74	1,839,541	12.13	163,243
Increase	-79,714	-69,150	-148,864	-.02	-548,199	.14	-49,74

THE WEEVIL PROBLEM.

FARMERS CAN ASSIST.

Wheat growers can very materially assist the Wheat Scheme in its endeavors to control the weevil pest. With the object of securing their co-operation the Supervisor of the Weevil Department of the Wheat Scheme (Mr. D. C. Winterbottom) has sent a copy of the following letter to each Branch of the Agricultural Bureau:—

Owing to the very serious menace facing the agricultural interests of the State generally through the ravages of the weevil pest, the Wheat Scheme is making strenuous efforts to deal with the pest, and would be obliged if you would arrange for a discussion to take place on this subject amongst the members of your Branch with the object of interesting farmers in the extermination of the pest, and enlisting their co-operation in the attempts at present being made to combat this plague.

It must first be fully understood that contamination of wheat by weevil can only take place from outside sources, and this is generally effected through the wheat at some time or other being placed in or near to some weevil infestation. It is well known that weevil can be found on almost all farms, and it may get into the new wheat in any of the following ways:—

1. By storing the wheat in weevil-infested barns or sheds.
2. By stacking the wheat on weevil-infested stacking sites or on old dunnage which may be weevil infested.
3. When harvesting is done, by means of strippers and subsequent winnowing, it is possible that infestation takes place when the wheat heads are tipped out on to old winnowing sites, which have possibly become infested with weevil.
4. By carting the wheat in wagons and drays which may be weevilly.
5. By using old bags which have contained seed wheat.
6. By harvesting the grain with farm implements and machines which have become infested by weevil.

These are all possible sources of infestation on the farm, and may lead to the wheat being touched before it even leaves the farm. It is, of course, known that many of our country stacking sites are infested with weevil, but here the matter comes within the scope of the Wheat Scheme, and the cleansing of these sites is receiving attention.

OLD WHEAT AND NEW STACKS.

It is probable, however, that the greatest source of danger from weevil is to be feared from the mixing of old season's seed wheat with the new wheat when delivering after harvest. This should on no

account be done, and if it is desired to deliver some old wheat, notification of the fact that old wheat is present should be given to the buying agent, so that he may keep this wheat separate from the new wheat when stacking.

It should be remembered that if only one bag of weevilly wheat is placed in a stack of several thousand bags, it will spread weevil very fast, and if as at present the wheat may have to be stacked for very considerable periods of time, the damage thus caused may assume very serious proportions, for it must be remembered that for each pair (male and female) of weevils present in the stack to-day, there will be about 8,000 weevil in 12 months' time.

There are several forms of insects found infesting wheat in South Australia, but of these the most important are:—

1. The Snout Weevils (*Calandra oryzae* and *Calandra granaria*).—These weevils are very similar in appearance, the difference being that the *Calandra oryzae* has wings, although it is very seldom seen flying. The *Calandra granaria* does not possess wings. Both are serious pests in stored wheat.

2. The Flying Weevil (*Rhizopertha dominica*).—It is also known as the biscuit weevil or the grain borer. It is really a beetle, it is generally smaller than the true weevil, has a polished back, a head very large in proportion to the body, and on warm days may be seen flying very freely. This insect is very destructive to wheat.

3. The Mill Bug (*Tribolium ferrugineum*).—This is also a beetle, red-brown in color, and looks like a true beetle. This insect is very common, but is not really a wheat-eating insect, although it is very destructive to flour. It can only live in wheat after the other two species have bored the grain and made the flour available for this insect to eat.

LIFE HISTORY.

It will probably be of interest to many of your members to include a short description of the life history of the weevils.

Snout Weevil (*Calandra oryzae*).—After mating with the male insect, the female proceeds to lay her eggs. She first punctures a sound grain of wheat, making a tiny hole only visible under the magnifying glass, and in this hole she then deposits her egg, usually laying one egg in a grain of wheat, then going on to another grain. During her egg-laying period she may lay as many as 100 to 400 eggs. The eggs, under favorable conditions, usually hatch to the larva stage in about four days' time, the larva then starts eating the flour of the grain, enlarging the cavity in the grain as it grows. This stage usually lasts for from 20 to 30 days. It passes into a pupa for two to three days, and then emerges as the fully developed weevil, which remains inside the grain for a further period of three or four days, and then eats its way out of the grain as the fully mature insect, which immediately mates, and commences the life cycle again. This process goes on about every six or seven weeks, so that in a temperate climate like South

Australia it is quite probable there are six or seven generations in a year.

The Flying Weevil (*Rhizopertha dominica*).—The life history of this insect is very similar to that of *Calandra*, except that this weevil lays its eggs in the flour and offal always found associated with weevily wheat, and which is especially abundant when this insect is present.

From this it will be seen that a farmer cannot remove the infestation by *Calandra oryzae* by simply winnowing the wheat, because (although the live weevil may be removed) the egg is deposited inside the skin of the grain, and will undoubtedly hatch out at a later date.

Should a farmer find on examining his farm that weevil are present, either—

1. In his Barn or Shed.—The shed should be thoroughly cleaned up, everything should be cleared out of the shed, all rubbish and old bagging burnt up, any loose grain or loose earth on the floor containing pools of wheat should be swept up and removed, the walls swept down, and the whole place then scalded out with nearly boiling water.

2. On Grain-stacking Sites.—All dunnage should be picked up, and if it is weevily it will probably be safest and best to burn it up for firewood and get new dunnage. All pools of wheat or loose earth with wheat should be removed. The clean surface could then be exposed to the hot summer sun, which will quickly kill weevil, or the surface of the site could be covered over with straw or cocky chaff and then burnt.

3. Drays or wagons, if infested with weevil, will be best sterilised by having boiling water poured over the woodwork.

4. Bags, if weevily, are best cleaned by a thorough brushing both inside and out, or better still by soaking in very hot water and then drying.

5. Harvesting machines should be thoroughly cleaned before being put away after harvest, and again thoroughly examined for weevil before being sent out into the field to commence harvesting, and if found infested with weevil, should be thoroughly cleaned and washed down with scalding water.

We trust that you will be able to arouse the farmers in your district to the seriousness of this pest, and induce them all to thoroughly examine their farms for weevil, and if it should be present get them to institute measures to eradicate the pest.

Should you desire any further information with regard to this matter we shall be only too glad to advise you. We shall also welcome any practical suggestions which may help in combating the pest.

POULTRY NOTES.

[By D. F. LAURIE, Government Poultry Expert and Lecturer.]

COMMERCIAL BREEDS OF POULTRY.

Without attempting a close description according to the standard of each breed, I propose to give a few particulars which will be of practical service. These notes are written for the benefit of those on the land who keep, or intend to keep, poultry for profit and not for exhibiting at shows. The show breeder, as a rule, pays chief attention to details of head points and feather, and takes little account of utility points.

It must be remembered, however, that every existing breed and variety owes its popularity in the first instance to utility. When the standards of each breed were drawn up the chief breeders and advocates of each breed or variety concerned met together and wrote down an accurate description of the best type known or to be known. The fact that "faddist" judges and "crank" breeders have taken liberties with the standard is the chief reason why there is a gap between utility breeders and the show men.

Type distinguishes breeds; colors, markings, &c., distinguish varieties. Thus all Orpingtons should be of one type—that is the breed type; the color of plumage, &c., makes the varieties. Orpingtons have the distinctive type of the breed which differs materially from that of any other breed, and so on.

Always seek to procure good specimens of any breed you may decide upon. A prize-winner may not have had any particular merit, unless a winner in good competition at an important show. For commercial purposes it is the better plan to secure good specimens from a breeder noted for the usefulness of his particular strain:

ORPINGTONS.

The following are the chief varieties of this breed:—*The Black*—The original. A hardy fowl, which if properly bred, is a good layer, and the chickens make excellent table birds. Skin and flesh white; eggs, tinted shells; legs and feet black. The exhibition stock now fashionable carry too much feather, and are seldom bred for utility. Some of the so-called laying strains are merely black fowls. The best of the laying strains are true to type and handsome birds. These are to be recommended. Color of plumage, black shot with brilliant beetle green. *The White*—A more recent introduction. Plumage, white; legs and feet and flesh, white. Will not stand extreme summer heat; this is especially so with older hens. A fine table bird; some strains are good autumn and winter layers. *The Buff* is an old favorite, but is very difficult to breed to color. A splendid table bird, hardy, but not such a good layer on the average as the other two; prone to become broody. Colour, golden buff throughout. The Blues, Spangles, and Jubilee varieties of Orpingtons are not of general interest.

PLYMOUTH ROCKS.

This is a large breed, longer on the leg and tighter in plumage than the Orpington—the type is totally distinct. Skin and flesh, creamy; splendid table birds; hens good layers, stand heat or cold well; hardy. The Barred Rock is the original, and is a handsome fowl. The White Rock is pure white in plumage, and is on this account somewhat easier to breed than the barred variety. The laying strains are always smaller than exhibition strains. Can be recommended. Buff, Columbian, Silver-pencilled, and other rocks are seen at shows.

SUSSEX.

These fowls are among the oldest-known English breeds. They are chiefly noted as table birds, but are fair layers, although the eggs are on the small side. First-class table birds. Flesh and skin, white. The chief varieties are Reds, Speckled, and Lights. Sussex should be large with deep square bodies like Dorkings. On no account should they resemble Rhode Island Reds.

THE RHODE ISLAND RED.

This is the most popular heavy breed in Australia to-day. It is of an uncommon type, that of the hens denoting the egg-producing type. Flesh and skin, pale cream; flesh of excellent quality. Hens good layers of fine tinted eggs. Chickens very hardy and quick growers. Color, deep cedar red, as near the same shade all over as possible; Reds have a long, almost flat back. The hens are very deep behind. Long keel bones, and not too long on the leg. Of very solid, yet fairly active appearance.

THE WYANDOTTE.

This is a breed of medium size, and when introduced this point was accentuated. A quick-growing breed of medium size was in demand. The chickens were hardy and quick growers, and the hens were good layers of nice large eggs. Breeding for exhibition has done much harm to the breed, and many strains lay small eggs. Some exhibition hens and pullets are too small. In the White section we see at shows hens which in size and type resemble White Orpingtons. The Wyandotte should not be coarse, is a short-backed, cobbly, compact bird—neither too long nor too short on the leg.

In commercial breeding it is advisable to select whole-colored varieties of any breed; thus Black or White Orpingtons, White Rocks, White Wyandottes. Barred Rocks are quite easy to breed if you understand them or buy your stock from a good breeder, who will advise you.

GENERAL UTILITY.

The above breeds can be bred to perfection, and then the hens will lay well—chiefly in autumn and winter—average, say, 140 to 180 eggs a year. The chickens grow well, and at 16 to 18 weeks old, if properly fattened, sell at profitable prices in all good markets. They are all excellent for the export trade.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Conference of South-East Branches.

(Continued from page 808.)

Evening Session.

TOPICAL QUESTIONS IN SOUTH-EASTERN AGRICULTURE.

The evening session of the Conference was opened by the Director of Agriculture, to whom a number of questions dealing with difficulties that had been met with by members of the Bureau in the South-East had been submitted. The Director said:—

I want to say that my address to-night is more of the nature of a patchwork than of an address. I asked the different Branches to submit any questions that they would like touched upon. I do not know that I can cover all the questions in the three-quarters of an hour that addresses are limited to, but I shall deal with as many as I can.

FORAGE CROPS AND MANURES.

The first question is as follows:—*What rotation of forage crops and manures would the Director recommend for the improvement of bracken land?*

To begin with, it is as well to define what I understand by the question, so that there will be no misapprehension. I know that there are different types of land that carry bracken—some good and some very poor. I have taken this question to refer to the poorer type of sandy land, and I shall assume that that was the class in the mind of the questioner. I would like to point out to you that whilst we are inclined to look upon land which is covered with bracken as poor land, and bracken consequently as typical of poor land, I have been rather surprised to notice in English publications that bracken appears to be accepted as a sure indication of good land, and quite recently, in a standard paper like *Nature*, I came upon the same inference, *i.e.*, that bracken is typical of good land. The South-East is hardly likely to support this view. Assuming that you have in mind the poorer type of light sandy land, there is one question that we should ask ourselves, and that is whether, at the present time, or even in our life time, we are doing right in attempting to reclaim for agriculture all the land in the State. I think, myself, that in many parts of South Australia we have been endeavoring to settle land before circumstances warranted it. There are types of soil that had been better left alone for the next 50 years. Whether we are to say that of bracken land is perhaps open to discussion; but taking that type of country as a whole, I think that it is rather early in our history to look to it as land suitable for agricultural purposes. What it seems to me could be done advantageously

with land of this class is what has often been done with similar land in other countries. So far as my observation goes, it does carry, at times, good timber—stringybark, for instance—and I question whether sandy bracken land could not be more profitably exploited for forest purposes, rather than farmed or even grazed. That practice has been followed in some of the countries with which I am familiar, in the south-west of France, for instance. The practice there has been to put land of this nature under rather fast-growing timber, and then, after the timber has been utilized, to put it under crop for a few years, and then to put it under timber again. I do not say that such a practice would be altogether practicable here; but the point still remains that this country could probably be utilized for forest purposes better than for other purposes. I do not, however, want to escape dealing with this question from the point of view of those who have small areas of this country, and who desire to have some method of handling it.

The first point to consider when we are dealing with land of this sort is its practical difficulties from the point of view of agriculture. It is of no use blinking the fact that this class of soil contains very little that is suitable to maintain plant life, and its chief objection is its poverty in organic matter and in mineral salts, particularly lime. And when we set about improving land of this character, we are faced with these difficulties from the outset; we must discover some plant likely to thrive under these conditions.

Dealing with the question of supplying organic matter first, and setting aside the possible use of farmyard manure, there are two methods open to us—one practically never utilized in this country, viz., green manuring, and the other grazing. I would like to say one or two words on green manuring, because it has been used in some countries as a means of reclaiming light sandy wastes, and whilst possibly it may not be practicable here, it is still worth while considering what has been done successfully elsewhere. Soil of this type has, in certain parts of Silesia, been reclaimed by ploughing under and burying crops of lupines grown for this purpose. Lupines happen to be a crop that will grow on land that has practically no lime in it. Well-grown lupines supply a fairly large amount of organic matter. It is perfectly true that this crop is not invariably a success when it is grown for the first time on new land, but when it is followed up with a second crop, the results are generally better. The failure of the first crop is often attributable to the absence from the soil of certain essential bacteria. We have here, therefore, one way of giving sandy bracken land the supply of organic matter which it lacks, viz., by ploughing under, one or two years in succession, well-grown crops of this type. No one would suggest that this practice should be adopted extensively in South Australia at the present time; nevertheless it has proved very successful in more thickly populated countries, and it is one of those practices which it is always of advantage to study when one is dealing with land of this type.

Assuming that the lupines grow well, the temptation always arises to graze the crop, and not to bury it; hence I shall assume that in many cases, if not in all, you would prefer the grazing proposition. For

the sake of enabling you to make a comparison of the difference in the amount of organic matter that you would bring into the soil through grazing and through green manuring, I have estimated that a three-ton crop of lupines, with 85 per cent. moisture, ploughed under, represents 1,008lbs. of dry organic matter brought to the soil. Grazing livestock would probably retain in their bodies about 75 per cent. of the organic matter of the lupines; hence 252lbs. of organic matter would be returned to the soil as animal droppings, or about one-quarter of the amount that would be brought to the soil had the lupines been ploughed under as green manure.

Grazing or green manuring makes provision only for the deficiency in organic matter of these soils. There are other materials that have to be brought to these sandy soils if they are to be of any value for agricultural purposes. I would suggest that in any case soils of this sort need, sooner or later, to be dressed with lime. This is a fact that applies to the bulk of our South-Eastern soils. I should be inclined, after the lupines, to dress the soil with $\frac{1}{2}$ ton of lime to the acre. Phosphatic manures would also have to be applied, and it is probable that you would have to dress the soil fairly heavily in successive years for this purpose.

So much for the general proposition, and I would like, by way of conclusion, to suggest the kind of treatment that I believe would be effective. In the first place, if you have any faith in green manuring, and the courage of your convictions, there would be two opening years under lupines regularly ploughed under; or the alternative would be to start straight away on grazing lines. If you are going to graze, the first difficulty would be to discover what type of crop would be likely to succeed in these sandy wastes. Moreover, if you are going to graze, it is no advantage to have a crop involving frequent tillage. Tillage operations waste organic matter, which it should be your object to accumulate in a soil of this type; hence you must look for some sort of temporary pasture likely to afford four or five years' reasonable grazing. To permit of this, you must dress your land with lime from the outset, and whatever the nature of the grazing crop you adopt, I would be inclined to dress it as well with a basic phosphate or even crushed phosphatic rock. The latter, if used sufficiently extensively, could probably be bought on rail in Adelaide for not more than about £2 per ton. If you can get material of this sort, which brings to your soil not merely phosphoric acid, but lime as well, you could afford to apply relatively large dressings—not less, at all events, than 6cwts. to the acre. In England pastures are sometimes dressed with Thomas's phosphate at the rate of $\frac{1}{2}$ ton to the acre, the view being that where pastures are concerned one heavy dressing is more profitable than several small ones. Next comes the question of the most suitable crop to adopt. One can only make suggestions in a matter of this kind, and I quite anticipate that many will not agree with me, but I would not be afraid to test lucerne. It is possible that it may be a dismal failure, but if it lasts out for a few years it will quite change the nature of the land. I feel that, in the presence of lime and phosphatic

manures, it will give reasonable grazing, and return to the soil a sufficiency of organic matter. As an alternative to lucerne, I would suggest a mixture of grasses in the proportions indicated in the following table:—

TABLE I.—*Suggested Grazing Mixture for Sandy Bracken Land which it is Intended Gradually to Improve for Agricultural Purposes.*

Prairie grass	10lbs. per acre
Perennial rye	6lbs. "
Cocksfoot	3lbs. "
Tall fescue	3lbs. "
Lucerne	3lbs. "
Paspalum	3lbs. "
White clover	2lbs. "
Subterranean clover	2lbs. "
Total	32lbs. per acre

You could try a grass mixture of this sort, or lucerne alone, and assuming that you could get fair grazing extending over four to five years, by the end of that time you should have put enough organic matter into the land to render it possible to take one or two crops out of it. Here, again, I think that where pasture of this type is broken, it might be advisable to give an additional dressing of lime prior to cropping it. As to the effect of putting wheat on recently broken pasture, so far as I know, wheat is not the crop to be placed in a position of that kind. Oats is the best of crops for new land. In the first place, you cannot get a seed bed suitable for wheat, and, secondly, the ground is always more or less sour. The types of crop, however, most likely to succeed on these sandy wastes we are endeavoring to reclaim are barley, oats, rye, and even pease, and, in certain circumstances, potatoes. After a couple of years cropping, bracken land should again be put under short period temporary pasture.

ERADICATION OF HOREHOUND.

The second question that has been submitted to me is:—*On light loamy soils liable to drift under bare fallow, when horehound is growing thickly, would the Director, under such circumstances, recommend early fallowing, with constant working of the fallow, to destroy young horehound plants, and sow the fallow with millet fairly early, with the drill, using every other hoe, thus leaving the rows sufficiently far apart to allow for summer cultivation? Or, as an alternative, does the Director think it would be more economical for such lands to plough and sow for early green feed, and when fed bare in September, to plough again and sow to millet, feed millet down, and plough again for green feed in March, &c.?*

In the first place, I did not before realise that horehound was a weed difficult to deal with, and it was news to me that it was likely

to be troublesome on the farm. I must say that I have been unable to find any reference to it as a noxious weed. In Europe it is looked upon as more or less harmless. In Victoria it is stated to be troublesome in pasture land. I understand that the young seedlings are the trouble. I should say that both proposals outlined by the questioner seem to be practical solutions, and without being able to speak from personal experience the proposal to grow a summer crop should be effective. Similarly the proposal for constant cropping appears to be good. As to which proceeding is the better, I think it will be found that the first proposal would give more satisfactory results.

BARLEY AND OATS FOR FORAGE.

When barley and oats are sown for early feed for ewes and lambs, and fed off during the whole of winter and in early spring, and when natural feed is plentiful, left to mature, would you recommend the feeding off again of such crops by sheep, or would it be injurious?

I think it would be dangerous to the animals to turn them into a field of ripe grain. I would prefer to let them go over the stubble after reaping the grain. This is rather a question that comes within the scope of a veterinary officer, but I have known of cases in which sheep have suffered through being put into fields with too many heads of barley lying about.

CRUSHED WHEAT FOR MILK PRODUCTION.

Would crushed wheat fed to cows or lambing ewes have the same milk-producing effect as bran?

It is a very difficult thing to compare two foods from the point of view of one special purpose in this way. If we could say, for example, that bran and wheat alone could be fed to cows and to ewes in lamb, to the exclusion of any other form of feed, we should be in a position to compare them reasonably; but such is not the case. We are compelled to give some other foodstuff with either wheat or bran, and the point comes to this, whether in any ration that we supplied to cows crushed wheat could take the place of bran without reducing the milk supply. By way of illustration, I have prepared the following table, in which is given the relative compositions of crushed wheat on the one hand and of bran on the other.

TABLE II.—*Showing Relative Food Values of Wheat and Bran Respectively.*

	Wheat.	Bran.
Digestible protein	10.2	13.0
Digestible fat	1.2	1.8
Digestible fibre	0.9	2.2
Digestible carbohydrates	63.5	40.3
Starch equivalent	73.2	45.2

It will be noticed that bran contains a good deal more protein, which is of importance from the point of view of milk; on the other hand, wheat has a good deal more carbohydrates or starch. In order to

bring the two foodstuffs back to the same basis, I have prepared, in Table III., two rations, which show the corresponding feeding rations for a stall-fed 1,000lbs. milch cow, yielding 30lbs. of milk daily, on a basis of equal weights of wheat and bran respectively.

TABLE III.—*Showing Corresponding Feeding Rations for Stall-Fed 1,000lbs. Milch Cow, Yielding 30lbs. of Milk Daily, on a Basis of Equal Weights of Wheat and Bran Respectively.*

Bran Ration.		Crushed Wheat Ration.	
Wheaten hay chaff	21lbs.	Wheaten hay chaff	16lbs.
Lucerne hay	10lbs.	Lucerne hay	16lbs.
Bran	6lbs.	Crushed wheat	6lbs.

The introduction of crushed wheat into the ration therefore implies an increase in the amount of lucerne hay provided, and a decrease in the amount of wheaten chaff.

FEEDING VALUES.

What is the relative feeding value of wheat, oats, barley, and pease in the growing stage, or as grain?

I take this to mean, "What is the relative feeding value of wheat as grain, barley as grain, pease as grain, &c., and the same crops as green fodders." In the first place, whatever comparisons one may make in this connection are only relative, and it is not possible to say definitely that the relative feeding values of different foodstuffs are always the same. For the same foodstuff you can get very great differences in value in different seasons. Hay grown in a good season has a certain value, which is not necessarily maintained in a bad one. All that one can do is to give the average position. Certainly, whilst we can compare fairly well, say, different grains one with the other, it is by no means easy to compare a grain with a green fodder. One represents bulk and water, and the other concentrated organic matter. I have endeavored to show a rough comparison in Table IV., the last column of which shows the relative values.

TABLE IV.—*Showing Relative Feeding Values of Oats, Barley, and Pease as Grain and Green Forage Respectively.*

	Digestible				Starch Equi- valent.
	Protein.	Fat.	Fibre.	Carbo- hydrates.	
Field pease (grain)	19.4	1.0	2.5	49.9	68.6
Cape barley (grain)	3.8	0.5	5.8	52.0	60.0
Oats (grain)	8.0	4.0	2.6	44.8	59.7
Green oats (in bloom)	1.4	0.4	4.9	6.5	10.0
Green barley (early growth)	1.8	0.3	3.1	6.4	9.6
Green pease (in bloom)	2.9	0.3	2.3	3.2	6.6

Roughly speaking, as a foodstuff, 100lbs. of pease would go as far as 114lbs. to 115lbs. of barley or oats, and as far as 680lbs. to 690lbs. of green barley or oats, and over 1,000lbs. of green pease in bloom.

DAIRYING.

Would the Director recommend dairying for the settlers east of the Naracoorte Range?

I am not altogether prepared to give an absolutely direct reply to this question, for the following reasons:—In the first place, I do not know that my knowledge of local geography is sufficient for me even to say where the Naracoorte Range is, and it would certainly be very difficult for me to know whether there are any local difficulties in the way of dairying. The second difficulty is that success in dairying is as much a question of temperament as of local conditions, because where one man succeeds another often fails. Consequently, it is difficult for me to give a definite answer; but what I would like to do is to get at it in an indirect fashion. If you take the South-East as a whole, or that portion of it where the rainfall is good, farming ultimately is bound to be built up on a basis of livestock. This does not mean that where wheat can be grown, wheat should be excluded; but that sooner or later you will gradually work in on your farms more livestock than is the case at the present time. I do not mean to say that you will grow less crops than you do at the present time, but it will certainly mean that a large proportion of what is grown on the farm will either be grazed, off or fed to livestock in the form of hay, or ensilage, or grain. I do not say that the grain used will necessarily be wheat; there are many other feed grains open to us that can be raised at less cost. Nevertheless, pig growers or fatteners can bear testimony to the fact that it often pays to feed even wheat to pigs. This much, however, is certain, that a large proportion of your crops will be not sold directly, but through your livestock; and this practice will have the indirect effect of gradually raising the farming value of your land. Whether you handle dairy stock, or pigs, or sheep will ultimately make little or no difference; the chief point is that you should be handling livestock that are congenial to you; other points are more or less secondary in importance. I must, however, admit that, given its relatively favorable conditions, I have often felt surprised that dairying should not yet have got a firmer grip of the South-East. I have always felt that in the South-East generally there should be no difficulty in keeping cows in milk from one year's end to the other. If you are disposed to rely on grazing exclusively, you will probably fail; but if, in relatively dry country to the north of Adelaide dairying can be practised successfully, surely you can practise it, too. This is an indirect reply, unless there are local difficulties of which I am not aware. I will, however, come out and say that unless there is some sort of hidden morass behind the range, I see no reason why dairying should not be practised there with great advantage.

SORREL.

What is the best means of destroying sorrel? Would lime help, and, if so, what quantity should be used and what is the best means of applying same?

Sorrel gives as much trouble in other countries as it does here. It is a trouble in some parts of France. Wherever sorrel flourishes, you can take it as an indication that the soil lacks lime. For the sake of

getting at this point, I have had some of the Kybybolite soils analysed, the results of which are given in the following table:—

TABLE V.—*Showing Analyses of Kybybolite Soils Liable and Not Liable to Sorrel Respectively.*

	Phosphoric.			Nitrogen.	Organic Matter.	Reaction.
	Lime.	Acid.	Potash.			
LAND LIABLE TO SORREL—						
I. Soil (limed)	trace	0.005	0.058	0.045	1.55	faintly acid
Subsoil	nil	nil	0.582	0.020	0.31	faintly acid
II. Soil (untreated)	trace	0.080	0.351	0.048	1.24	acid
Subsoil	nil	nil	0.394	0.025	0.71	acid
III. Soil (farm manure)	trace	nil	0.093	0.073	2.62	acid
Subsoil	nil	nil	0.089	0.020	0.63	faintly acid
CRAB HOLE LAND NOT LIABLE TO SORREL—						
IV. Soil	0.46	0.055	0.254	0.095	3.20	neutral
Subsoil	0.20	nil	0.373	0.038	0.96	faintly acid
Good Average Standard Soil	1.0	0.1	0.1	0.1	—	—

It will be noticed from these analyses that lime is practically absent from all of the soils liable to sorrel. At Kybybolite this year one particular field gave an excellent illustration of the effect of lime. One part of the field was badly troubled with sorrel, and the other was practically clear of it. The latter had been dressed with lime. Referring back to Table V., an inspection of the column marked "Lime" will show that in the land liable to sorrel there is practically no lime. In the crabhole country, which never carries sorrel, there is an appreciable percentage of lime. It is a matter of almost universal experience that if we want to get rid of sorrel, we must use lime, which, apart from its effects on sorrel will at the same time help to improve our land for other purposes. There is one important point to be borne in mind. Land that is dressed with lime just before seeding will have just as much sorrel in the crop as if it had not been dressed at all. The lime takes a certain time to make its presence felt. Therefore a dressing of lime should not be put on just before seeding. If you fallow, you should dress the land immediately after fallowing. As to the quantity to apply, there is no particular advantage in repeating an operation too frequently. It is quite possible that relatively light dressings of lime will have a good effect on one crop; but where you have land in which there is practically no lime, it is an advantage to give a dressing that will last five years or more. Consequently, I would prefer to put on 1 ton to the acre, although a lesser quantity might do. Lime can be applied to the land most cheaply by means of special lime spreaders.

LAND EXHAUSTED BY SUGAR BEET.

Will the growing of sugar beet be detrimental to the growth of a cereal crop the following year?

I take this to mean, "Can sugar beet be grown in rotation with a cereal crop?" This is a question that can be replied to very definitely on the results of the experience of sugar beet growing countries. The regular rotation practised in France is sugar beet, wheat. That is the

practice of a country with long experience of beet. Should we ever take up sugar beet, we shall have to realize that it must take first place in any rotation in which it enters, that is to say, the land must be tilled and handled from the point of view of sugar beet, and not from that of any other crop in rotation with which it may happen to be grown. The disadvantage of growing wheat after sugar beet is that the sugar beet is in the land rather late. It does not develop very rapidly, and the time that elapses between the harvesting of the sugar beet, the grazing off of the tops, and the preparation of the seed bed, is too short to enable one to prepare a suitable seed bed for wheat. That is from the point of view of the wheat crop; hence I would prefer to grow another cereal crop, either barley or oats, both of which are relatively more hardy, so far as the preparation of the land is concerned, and can also be sown later in the season.

IMPROVING PASTURES WITH PHOSPHATES.

Would the use of phosphatic manures on pasture land have any effect on the worms responsible for sheep losses? Will you recommend its use on grass lands, and how should it be applied—drilled or broadcasted, and what quantity per acre?

I assume that lung worm is the trouble. I should say that you should be able to secure the required results by the use of a lick containing lime, super., salt, and sulphate of iron, in every paddock where the sheep were put to graze. Much of the poorer South-Eastern country is lacking in lime and phosphates, and I certainly agree that much of the poorer pasture land will benefit by a rational dressing of phosphatic manures; this will strengthen the feed, and indirectly the sheep liable to worms. I think what ought to be done would be to apply a dressing of raw phosphatic rock wherever the rainfall is reasonably heavy. In a single dressing you would be applying both lime and phosphates, and where the rainfall is sufficiently heavy the results will probably be satisfactory. It is certainly worth trying, because the cost of the material is reasonable. A basic form of phosphate is necessary for pasture lands, or if it has to be superphosphate, it must be in conjunction with lime. As to how it should be applied depends on the circumstances, but it is quite certain that to scatter manure of this type on land that has not been loosened does not give the manure a chance to penetrate into the land. Supposing you have land on which you broadcast this phosphatic manure. Unless this land is level, with rain it is washed into the lower portions, and so the land does not receive the benefit. I therefore prefer to drill it in. As to the quantity to be applied, it is a matter whether you consider it worth while doing the job well once, or whether you want to go over the land at frequent intervals. So long as the cost of the manure is not prohibitive, I would not shrink at 10cwt. to the acre.

TIMOTHY.

Would Timothy be a suitable grass for the South-East? On what kind of soil does it thrive best?

Timothy is one of those grasses popular almost exclusively in America. It happens to be a native of Europe, but it is not grown

there to any extent. Whether it is likely to do here or not I am not too certain. I cannot find any indication that it is a good grazing grass. Its chief use is as hay. Supposing you could grow it, it would be with the idea of displacing some crop which at present you grow for hay. The Americans state that the grass does not stand being trodden down much by livestock, and it tends to become bare very quickly. It might be put in with other grasses on land left out for three years. It is not a grass that stands drought, and it grows on relatively rich soils. Consequently, I do not think it likely to take the place of the best types of grasses that you can grow here.

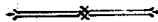
THISTLES AND MUSTARDS.

The Botanical Assistant (Mr. H. W. Andrew), with the aid of mounted specimens and enlarged drawings, explained the chief distinguishing characters of the various thistles and wild mustards, which have proved more or less troublesome as weeds in South Australia. He said the plant known generally to South Australian farmers as the Scotch thistle was really the spear thistle or spear plum thistle of England, and that this confusion of names had given rise to many mistakes—the true Scotch thistle was practically unknown to South Australian farmers. It was pointed out the same trouble over names arose in connection with the true star thistle, the saffron thistle, and the yellow star thistle or cockspur, all of which were frequently given the name of star thistle. Farmers had at various times urged that the cockspur should be struck off the list of noxious weeds, but it was reasonable to assume they were not all familiar with the proclaimed cockspur—it was the Maltese cockspur that farmers knew generally; the latter appeared to be more common, though a less formidable plant, the flower heads not having long spines on the flower heads that the proclaimed cockspur possessed.

After dealing with the other members of the thistle family exhibited, Mr. Andrew drew particular attention to the creeping or perennial thistle (sometimes called the Canada thistle), which so far was known to exist in this State within seven or eight miles of Mount Gambier only. It was now widely distributed throughout the world. It was proclaimed noxious in Victoria, where it was stated to be general, and also proclaimed in South Australia. It could be readily distinguished from the other thistles by its creeping more or less horizontal roots and the fact that it produced flowers year after year from the same roots.

Another group of weeds—those belonging to the mustard family—gave trouble to the farmers also. The Oriental rocket, the hedge, and other mustards were often confused in the minds of farmers and others with charlock, from which they were quite distinct. The last-mentioned plant appeared to be comparatively rare in South Australia. The turnip weed or giant mustard, with its very distinctive roundish pods, very common in certain northern districts, was stated to be considered noxious in Italy, one of its native homes, but in South Australia they did not have a great deal of information about it; sheep properly managed should keep it under control, but they had no local or other data regarding how long the seeds would remain dormant in

the soil. A factor making for considerable trouble in the control of charlock, for instance, was the capacity of some of its seeds to remain in the soil for many years before germinating. They had no reliable information in regard to the characteristics of the turnip weed in that respect, which made it difficult to properly estimate its degree of harmfulness to the wheatgrower. Two plants very troublesome in limestone soils, because of their long flowering period and prolific seeding habit, were the very evil-smelling sand rocket and the extremely sweet-scented two-horned stock. The seeds of the latter were listed in at least one seedman's catalogue and sold as the night scented stock. Several other mustard weeds were also shown, and while all of these under certain conditions were more or less troublesome, they could not be compared to the hoary cress, which was proclaimed noxious in Tasmania. It was a particularly objectionable plant, with long-lived underground parts (which made it difficult to eradicate), and in one or two localities of the State flourished exceedingly well, growing as high as the cereal crops, and producing great quantities of seed. It would doubtless spread from these infected areas by way of dirty hay and chaff.



Conference of Upper-Northern Branches.

Branches of the Agricultural Bureau situated in the Upper Northern districts of the State met in conference at Orroroo on Friday, April 26th. Although the numbers present were not all that could be desired, owing to seeding operations being in full swing, the interest displayed by those who attended showed that the work of the Bureau was appreciated.

DELEGATES AND VISITORS.

The Department of Agriculture was represented by Professor Arthur J. Perkins, the Chairman of the Advisory Board of Agriculture (Mr. Geo. Jeffrey), Mr. F. Coleman (member of the Advisory Board of Agriculture), the Poultry Expert (Mr. D. F. Laurie), the Dairy Expert (Mr. P. H. Suter), and the Acting Secretary of the Advisory Board of Agriculture (Mr. H. J. Finnis).

The delegates representing the various Branches were:—Orroroo—L. R. Cottrell, T. H. P. Tapscott, W. W. Collins, J. C. Jagger, K. McLean, C. R. McDonald, H. J. Cottrell, J. McNaughton, M. J. Neylan, A. N. George, E. Laughton, J. J. Dennis, G. Graham, L. S. Connor, H. Matthews, W. H. Birrell, W. D. MacDonald, L. Haynes, E. A. Stott, and A. L. Brice (Hon. Secretary); Quorn—R. Thompson, J. Hannigan; Morchard—R. Jasper (President), H. G. Kupke (Hon. Secretary), H. Brown, J. W. Reichstein, E. J. Kitto, H. A. Toop, W. Toop, H. A. Tilbrook, B. S. McCallum, L. G. Toop, W. A. Brown; Wepowie—E. J. Pearce, S. Fogden, J. G. Crocker, P. Burns, T. F. Orrock (Hon. Secretary); Tarcowie—J. Symons, J. Burgess, J. Smith, H. Edwards, T. Ninnies; Carrieton—T. E. Shepperd and T. H. Fuller (Hon. Secretary); Willowie—D. McCallum, F. Bull, W. P. Foulis (Hon. Secretary); Amyton—W. Gum, S. Thomas.

THE OPENING.

The Chairman (Mr. L. R. Cottrell), in a short speech, extended a hearty welcome to the visiting officers, and called on Mr. George Jeffery (Chairman of the Advisory Board of Agriculture) to declare the Conference open.

In the course of his opening address, Mr. Jeffery made a vigorous appeal on behalf of the war loan. He regarded open-handed subscription to the loan as one of the means by which they could do a portion of the duty that had been left for them to do. He dealt with the question of economy, emphasizing the point that whilst that was a time for economy, both individual and national, in his opinion, it was decidedly unwise to neglect in any way to foster production. If they could produce more than they were doing at present, and had done in the past, they were going to be in a better position, and nothing that could be done to increase and encourage production should be overlooked. That being the case, he was very much in sympathy with the Agricultural Bureau system. They had the means of encouraging, in a substantial way, the primary producer. There were 200 Branches of the Agricultural Bureau, with a membership of over 5,000, and he was proud to say that out of that number 400 members had volunteered for active service. Some of them had paid the supreme sacrifice. Since the war began the efforts of the Bureau had not decreased. There had been 45 new Branches formed since the commencement of hostilities. Many aspects of the changed conditions prevailing on account of the war were touched on, more especially in regard to the methods of marketing primary products. He concluded with an eloquent appeal for greater efforts in production, as a national duty, and declared the Conference open.

THE OUTLOOK OF THE AGRICULTURAL INDUSTRY.

This subject was dealt with in a paper by Mr. E. J. Kitto, of the Morchard Branch. Agriculture, he said, had been the mainstay of the country, but from the present outlook it was a debatable question whether it was not becoming a precarious undertaking, paying due regard to the price that had to be paid for all materials and commodities necessary for the production of a crop, together with the wear and tear of implements, and the loss of stock through drought and other causes. As an instance, he quoted the price that had to be paid for cornsacks, namely, 10s. per dozen. The farmer had to sell the bag as weight of wheat, which worked out at a shade over 1d. per bag, or a loss of nearly 9s. per dozen, or nearly 3d. per bushel on the grain. That, of course, had to be added to the cost of production. He admitted that the war had something to do with the present high prices, but he pointed out the fact that as soon as farmers started to purchase their own bags the price immediately started to rise. There was hardly an article used in the production of the crop that had not risen to such an extent as to make the purchase of it almost prohibitive. If the industry were to be carried on profitably, it would be necessary for the cost of production to be reduced, or the price of the produce to be increased. He urged a careful preservation of machinery and implements.

A general discussion followed the reading of the paper. The Director of Agriculture said the writer of the paper should not overlook the fact that farmers did not constitute the only section of the community which at the present time found difficulty in making income balance expenditure. He refuted the idea that wheat-growing was decreasing. As a matter of fact, since the war the State had been producing more wheat than ever was the case formerly. Where farmers had found the difficulty was in the getting rid of their produce; but they would have to admit, with the shortage of ships, they could not get the wheat away, and those were circumstances over which they had no control. Reference had been made to some farmers who had taken up livestock. He hoped more of them would be in a position to do so. Wheat had always been the staple product of the country, and the producers were in an unfortunate position, because their produce was difficult to market. The Government had done much to make things easier, and as time went on he felt sure that things would improve. Mr. J. Coleman (Advisory Board) said it was inconceivable that any Government should not protect the primary producer. He emphasized the necessity for increased production. They wanted more wheat from the land, and more wool from the sheep, and more milk from the cow. If they could do that he felt sure they would come out all right at the end.

MACHINE SHEARING.

A paper on this subject was read by Mr. S. Manning, of the Carrieton Branch of the Agricultural Bureau (see page 817 of the May issue of the *Agricultural Journal*).

Mr. George Jeffery (Chairman of the Advisory Board), in opening the discussion on the paper, said he did not think there was any great advantage to be derived from the use of the machines. Many of the large sheds were falling back on the blades. It was a matter of whether they could get the necessary skilled blade shearers. He pointed out that there had been losses of sheep through their being too closely shorn. Mr. W. Gum (Amyton) had had his sheep shorn and put out in the paddock at a time when snow was falling, but he had never lost a hoof. In many cases the expert shearer would not stop to shear a small flock, and if they did the sheep were not shorn properly, because the men were anxious to move on to the larger sheds. In reply to a question, Mr. Jeffery stated that the pelt of the blade-shorn sheep was worth more than that of the machine-shorn sheep.

The Dairy Expert (Mr. P. H. Suter) then dealt with various matters appertaining to the dairying industry.

Afternoon Session.

MIXED FARMING.

Mr. E. J. Pearce, of the Wepowie Branch, who read a paper dealing with the question of mixed farming, said he would take as an illustration a farm consisting of 900 acres, which would be subdivided into blocks of 300 acres or smaller; 250 acres could be cultivated each

year. He would allow 150 acres for the homestead and for the growth of green fodders and for experimental plots. He would work the land on the following system:—Fallow, wheat, and then pasture. Fallowing should be commenced as soon after seeding as possible. He favored the use of the cultivator for fallowing, because it enabled one to get over the land in less time, and the weeds would commence to grow more quickly. In the event of fallowing being left until late, he suggested that the plough should be used. He would then run the harrows over the ground, and again use them later on in the season. He considered $1\frac{1}{2}$ bush. of seed and about 80lbs. to 100lbs. of super. to the acre should be sown, because a thick crop of wheat would stool out more quickly, and would retard evaporation. Cows were a good side line, but one must be prepared to look after them properly. On an area of 900 acres 250 to 300 sheep could be safely run, and he favored the Merino breed of sheep as being most suitable for that district. Pigs and poultry could also be profitably kept.

OTHER DELEGATES' OPINIONS.

In discussing the paper, Mr. W. Gum (Amyton) said that a bushel and a half was too much to sow. In that district he had found that the land would not respond to more than 40lbs. or 50lbs. Professor Perkins said he could not agree with the remarks of the previous speaker that a bushel and a half was always too much to sow. In exceptional cases they could sow 100lbs. of Gluyas, which was grown in that and many other districts. One and a half bushels seemed excessive in any case in which the land had not been well cultivated. He thought they should vary the amount of seed sown according to the season. If late, it was best to sow thickly; if early, thinly. On the question of manuring, they could only be guided by local conditions. At Roseworthy they had tested different quantities year after year. From the experience of a single year they should not attempt to lay down a hard and fast rule. The experiment must be carried on for several successive years. Through the use of additional super. the carrying capacity of the farms would be considerably increased. Mr. J. Brewster, of Quorn, expressed the opinion that the condition of the grain at the time of sowing had a considerable bearing on the amount of seed used to the acre.

FINANCE.

Mr. B. S. McCallum, who contributed a paper on this subject, said that the work of the year should be carefully viewed from the standpoint of finance. The person about to commence farming should use judgment in the investment of his capital, he said. The writer of the paper dealt with the differing conditions under which land could be obtained. The selection of the working plant should receive thought, particular regard being paid to the nature of the land that had to be worked. Many machines very quickly paid for themselves, if the purchaser chose the ones best fitted for his requirements. Whilst the cost of all machines was high, on the other hand labor was scarce, and wages and living expenses were high. If with an up-to-date machine the farmer could accomplish work that would otherwise require up to

four men, then a considerable saving would be effected. He referred to the disadvantages of borrowing too freely at heavy rates of interest, and mentioned that amongst many, especially young men starting farming, there was a tendency to purchase machinery on the time-payment principle. If after the first season or two a failure of crops was experienced, there was a danger of disaster.

FREE PARLIAMENT.

Mr. W. Gum, on behalf of the Amyton Branch, initiated a discussion on the compulsory dipping of sheep. The decision of the Government came as a great surprise to many farmers in the northern districts, he said. His Branch was of the opinion that it was quite unnecessary to dip sheep in the dry northern districts of this State. He did not think the dipping would make any improvement in the fleece, and considered it very unfair that the man whose flock was thoroughly clean should be forced to dip his sheep. Mr. Hannigan (Quorn) considered that the district councils in the various centres should put down dips for the use of the farmers of the district. Mr. G. Jeffery (Advisory Board) said the very fact that the sheep was infected with tick or lice was evidence that the sheep was not doing as well as it should. The Act was to protect the man who had clean sheep against the man who was careless. They should get to work and make preparations for the dipping of the sheep. It was ridiculous to think that every farmer should install a dip only for his own use. Could not they work on a system of co-operation amongst themselves? Mr. E. J. Kitto (Morehard) said one and all of the members of the Morehard Branch were opposed to the Act. The sheepowners outside of the district council areas were free from the operations of the Act, and he considered it most unfair and unnecessary in the dry districts of the North. Mr. H. J. Finnis (Acting Secretary of the Advisory Board of Agriculture) said in the first place the matter of compulsory dipping of sheep was thoroughly thrashed out at last year's annual Congress, and the following resolution was carried without a single objector:—"That the provisions of the Stock Diseases Further Amendment Act should be extended to include all district council areas in the State, and that only poisonous dips should be used." The Riverton Branch of the Agricultural Bureau had already put down a sheep dip on co-operative lines, and it had been very successful. Already there had been inquiries from other Branches for particulars for the construction of a dip on similar lines.

STANDARDS OF SUPERS.

Mr. E. J. Kitto (Morehard), in opening a discussion on this question, suggested that members of Branches should send down samples of manures to be analysed, in order that they might know what each make of super. contained. Professor Perkins said the Government had agreed to amend the Act as it existed at present. Inspectors would visit the factories and take samples from the heaps in the works.

MILKING MACHINES ON SMALL FARMS.

In reply to a question, the Dairy Expert (Mr. P. H. Suter) said milking machines had been used with success in Victoria, New South Wales,

and New Zealand on small farms. Those who could command labor would no doubt prefer hand milking. The question was one chiefly of labor difficulties, and with the shortage of labor ever increasing, he believed the milking machine would have to be more generally adopted. Many years ago the use of the machines had absolutely spoilt cows, but at the present time men of the most successful standing in the western parts of Victoria had installed machines, and were speaking in very high terms of them.

ROAD PROTECTION.

Mr. Kitto raised the question of the proposed alteration of the Width of Tires Act. There was an evident fear in the minds of many farmers that they were to be prevented from driving four horses abreast in their wagons. After discussion, the following resolution was carried:—"That this Conference views with considerable apprehension the proposal to limit the width of the load carried on wagons to 11ft."

HOW TO HELP THE FARMER.

Mr. J. G. Crocker (Wepowie Branch), in a paper on this question, said at the present time the chief products of the farmer, wheat and wool, were under Government control, and the farmer was forced to accept whatever price was decided upon. To produce that wheat and wool certain necessities were required, but the price of those had risen to such an extent as to make farming unprofitable. Another difficulty they had was that the rabbits were coming in from the back country, where they had accumulated on the runs of the large landholders, and he considered that the Government should offer some assistance for the destruction of this pest. It was practically impossible for a man to start farming on a new block of land with the present high prices ruling for wire netting, fencing wire, galvanized iron, and implements and machinery. If the Government controlled the products of the farmers, they should at least have something to do with the prices that were paid for the articles necessary for that production.

SALVATION JANE.

Mr. A. H. George (Orroroo) contributed a paper, in which he discussed the question as to whether Salvation Jane was a noxious weed. Whilst that plant, he said, was not as valuable as such grasses as barley or spear grass, or such herbage as geranium, yet when Salvation Jane was young and green, sheep readily devoured it, and when the plant was in flower, sheep, cattle, and horses would all eat and thrive on it, when no other feed was available. Cut and stacked, or, better still, ensiled, it constituted a valuable standby. It had been objected to that it crowded out more useful herbage. Whilst that appeared to be an objection at first sight, in reality its vigorous growth and rapid spreading tendency commended it to them. He concluded that the plant was not noxious. In the discussion that followed the reading of this paper, Mr. W. Gum, of Amyton, discounted the idea that the weed did not crowd out more valuable fodders, but he quite agreed that the plant was valuable as a feed for sheep. Mr. A. L. Brice, of Orroroo, had found that by keeping sheep on the

land where the plant was at all troublesome, the growth of it could be checked to a considerable extent. Eventually the following resolution was adopted:—"That this Conference desires to express the opinion that Salvation Jane is in the North a useful plant, and would oppose any attempt that might be made to declare it a noxious weed."

Evening Session.

SHEEP ON THE FARM.

Mr. W. P. Foulis (Willowie) contributed a paper on this question, which was read by Mr. A. L. Brice. The paper read as follows:—"A controversy has lately taken place on the question 'Meat *versus* Wheat Production on our Farms.' In my opinion we should produce as much wheat as we possibly can, and at the same time graze as many stock as this will allow. My reasons for advocating the growing of wheat are as follows:—Owing to the great war, foodstuffs are becoming very scarce, millions of people are living on enough only to provide a bare existence. When the war is over these people must be fed, and I look upon it as our duty to produce as much grain as possible, so that when it is possible to ship it away, we may have the supply to meet the wants of these people, and also add to the wealth of our land. If our pastoral country were fully stocked, the cry to produce more meat on the farms would carry more weight. We must look at the question from a national standpoint. I maintain more wealth can be produced off a given area by producing wheat than by using it for grazing purposes only; also that the net income to the owner is greater. Naturally we consider ourselves first, and if the net incomes were about the same, we would choose the easier; this being so, we could not complain if legislation were brought to bear to compel us to put our land to the best use from a national standpoint—that is, the use from which the greatest amount of wealth can be produced. In my opinion, this can be done by growing wheat, supplemented by raising sheep. It is with the farm flock I wish to deal in this paper. The first consideration is the class of sheep to be carried. The main flock should be breeding ewes. I prefer the Merino, as she produces a valuable fleece, is a good mother, and is a quiet non-fencer. This latter reason carries great weight with me, as the fencing proclivities of many other breeds absolutely override any advantages they possess. The number of sheep to be carried is an important matter. No hard and fast rule can be applied; seasons and country vary, so must our flocks. Taking a 640-acre block as a basis, as a general thing a flock of about 35 ewes would be sufficient. This would assure that in the average season they would have sufficient feed to rear lambs, keep fat, and produce a good fleece. Under present circumstances, when a small number is kept, I favor running the rams with the flock all the time. I would advise having two rams, as this reduces the risk of a season being lost, as is sometimes the case where only one ram is kept. For reasons previously mentioned, I favor the Merino ram. Thirty-five ewes should raise at least from 45 to 50 lambs in a year. These may be sold off in small lots at any time after they are five months old. I prefer to keep them (if feed will allow) until about 12 months old, when a good figure

can be realized for them. It is surprising the weight attained by lambs reared from small flocks and always kept fat. Working on this method, we would have an average flock of about 80 sheep. At present prices the income return should be as follows:—

	£	s.	d.
45 lambs (rising 12 months), at 27s. 6d.	61	17	6
Wool—35 ewes, 8lbs. each, at 1s. 3d.	17	10	0
2 rams, 16lbs. each, at 1s. 3d.	2	0	0
35 lambs, 4lbs. each, at 8d.	4	13	4
	£86	0	10

From this must be deducted expenses for shearing and carriage and commission for sale of wool. With a small flock most young farmers can do their own shearing, and secure a buyer for their lambs, and so save expenses. It is advisable to keep back a few ewe lambs each year to keep up the breeding stock, selling off the older ones. This would make no difference on the balance-sheet, the ewes taking the place of the lambs in the sales account. The advantage of the method outlined is that the size of the flock is easily adapted to circumstances. In a season when feed is not plentiful the lambs can be sold off earlier, making the average flock smaller. At a time when grass is abundant, the lambs could be kept on, and the fleece go to swell the funds. I find that a small flock requires very little attention. A good supply of water, to which they have free access during the hot months, is absolutely necessary. Shade should also be provided. In a district in which pepper trees grow so well, it seems a pity that more has not been done to grow a few in each paddock to provide shade for stock. If the ewes are lambing during the hot months, it is advisable, if possible, to have the flock in a paddock near the water; the fewer gates to go through the better, as the lamb often stops at the gateway, and if the mother is not a good one, the lamb is lost. The better way, if possible, and this is not always the case, is to have a small paddock with water in it for the lambing ewes. It is a great advantage to have water in the paddocks, and will add to the success of the undertaking. When ewes are lambing I make it a practice to keep away from the flock, so as not to disturb them—look at them often, but from a distance. I find that when Merino rams are used, assistance is seldom required by the lambing ewe. In preparing the clip, keep the sheep clean, shear in a place free from broken straw, &c. Skirt the fleece a little, but not too deeply. Brand the bales neatly; keep them clean. Have the clip as presentable as possible; adopt a small brand. Shear in the spring, just before the grass seeds trouble. The flock will then have a lighter fleece to go through the summer with, and fewer grass seeds will be collected."

Mr. G. Jeffrey said he first of all wished to apologise for the absence of the Wool Instructor (Mr. Henshaw Jackson). He congratulated Mr. Foulis on his paper, but there were several points in the paper on which he would like to speak. First of all was

the question of running the rams with the ewes all the year round. Surely nothing could be more unwise. It was also a mistake to assume a basis of 1s. 3d. as a price for wool. He was struck with the idea in the paper recommending Merino sheep in the Northern Areas. They were the best kind of sheep to keep, and he advocated keeping the big-framed Merino sheep. They were more robust, had better constitutions, and one had something on which to build a good fleece and mutton. In regard to the question of classing the clip, under the old conditions it paid to class before sending the wool to market. If that were the case then it was infinitely more desirable to class to-day. He then proceeded to explain the procedure adopted under the present scheme of marketing wool. If they had Merinos and Crossbreds they should not mix them, and if they had heavy and light fleeces they should keep them separate. Ugly and very coarse fleeces should be kept apart, and they should see that the bulk was even and bright. A short or fatty fleece should be put on one side.

The Director of Agriculture (Prof. A. J. Perkins) said the writer of the paper did not follow the orthodox method of handling sheep on the farm. It must be remembered that sheep could not be kept on the same lines on a farm as they were on a station. One point struck him in particular in the paper, namely, the carrying capacity of the farm. Thirty-five ewes was not enough on a farm of that acreage. At Roseworthy, where he worked for a number of years, they had about 1,600 acres. Of that area they had between 600 and 700 acres under wheat and hay, 200 acres barley and oats, and 500 to 600 acres fallow, which would leave somewhere about 200 acres of pasture land. A certain area of forage crops was grown. Over a number of years they kept a sheep to the acre. A farmer would not be able to do that unless he had his holding well subdivided and considerable experience in the handling of sheep. Thirty-five sheep to 640 acres seems unnecessarily low. Reference was also made to the practice of running the rams with the ewes. That most primitive method would in all probability result in the lambs being dropped at those intervals at which there was no feed available. He thought the lambs in that district should be dropped in winter, when the feed was at its best. They could not successfully run sheep on a farm unless they had small paddocks, but he realised that in these days that presented a difficulty. They must also supply water in each paddock. He would rather not keep sheep than have to drive them to water. Dams were certainly not the best method of providing watering arrangements for the sheep; in many cases the water was dirtied and disease transmitted amongst the flocks. When dams were used they should be fenced off, and the water raised into troughs, either by windmills or hand power. He congratulated the writer of the paper particularly on his views in regard to mixed farming.

NEXT CONFERENCE.

It was decided that the next Conference should be held at Quorn.

Conference of River Murray Branches.

The fourth annual Conference of River Murray Branches of the Agricultural Bureau, which was held at Berri, on May 21st and 22nd, probably ranks as the most successful and productive gathering of agriculturists that has been held since the inauguration of the Agricultural Bureau system in 1888. Despite the fact that within the two days the Conference was sitting for five sessions of nearly three hours each, interest never wavered, and the keenest attention was given to the many papers and addresses that were dealt with.

Seven Branches were represented, and the highest attendance was recorded on the Tuesday evening, when over 200 producers were present.

The delegates were as follows:—Berri—Moss, E. R., Lewis, W. R., Murrell, R. G., Judd, F. R., Norman, J., Stone, P., Peacock, L., Hardwick, A. G., Jarvis, A. G., Fiedler, W., Cheriton, J. C., Chapple, I. A., Fiedler, A., Wilsch, P. M., Powell, W., Halliday, E., McGlasson, F., Fenwick, W. H., Mills, A. V., Fowles, V. M., Mitton, E. G., Johnson, J. R., Arndt, F.; Pyap—Beverley, G. W., Cox, B. H.; Renmark—Waters, W. H., Basey, F. H., Howie, H. D., Woodham, W. R., Keteki, C., Pitt, L., Philpott, A., Beckington, H., Hooper, F., Townsend, A., Hayward, J., Weste, O., Morley-Taylor, E., Taylor, H. S., Beesley, A. J., Strachan, A., Bunday, Petersen, J. K.; Mypolonga—Wiadrowski, A., Cailes, L. J., Farnham, W., Heddle, G. M., Horner, G. E.; Murray Bridge—Bell, R. S., Commyns, J., Medwell, A.; Waikerie—Iffould, A. G., Crabb, A., Lewis, A. W., Francis, W., Letman, H. F., Miller, E., Bannear, J., Isaacson, A. R., Goodchild, F. R.; Kingston-on-Murray—Farley, W. F., Stubbs, P., Cramer, P. F., Weatherill, J.; Ramco—Darling, J., Jackman, G., Lewis, F., Burroughs, E.

A very fine exhibit of fresh and dried fruit and almonds was tabled by the Berri Experimental Orchard. The school children of the local school staged a display of native and introduced plants found in the district. The silver cups presented by the Berri Branch of the Agricultural Bureau for the holder of the best-worked blocks were also on exhibition.

OFFICIAL VISITORS.

Headed by the Minister of Agriculture (Hon. E. A. Anstey, M.P.), there was a good representation of departmental officers, including the Director of Agriculture (Professor Arthur J. Perkins), the Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.), the Poultry Expert (Mr. D. F. Laurie), the Manager of the Berri Experimental Orchard (Mr. C. G. Savage), the Botanical Assistant (Mr. H. W. Andrew), and the Acting Secretary of the Advisory Board of Agriculture (Mr. H. J. Finnis).

Local arrangements were in the hands of the Berri Branch, and the smoothness with which the Conference proceeded was a striking tribute to the enthusiasm of the Hon. Secretary of the Branch (Mr. W. R. Lewis), on whose shoulders the bulk of the work fell.

The chair was occupied by the president of the Berri Branch (Mr. E. R. Moss).

PROCEEDINGS.

Proceedings were commenced by the assembly singing the National Anthem, after which the chairman extended a hearty welcome to the visitors, and called on the Minister of Agriculture to declare the Conference open.

OPENING ADDRESS.

The Hon. E. A. Anstey, M.P., who on this occasion attended a Conference of the Agricultural Bureau for the first time in the capacity of Minister of Agriculture, was tendered a hearty reception. He considered it an honor, he said, to have the privilege of opening that, the fourth Conference of the River Murray Branches of the Agricultural Bureau. He congratulated the producers on the excellent system of the Bureau, and of the work that had been done during the last few years. As the administrative head of the Department of Agriculture he was very much in sympathy with the work of the primary producer. Although he might not be able to give the settler everything that they requested, he promised that he would always give deep consideration to any matters that were brought under his notice. He felt sure that they realized that they had in Professor Perkins a most capable officer, and he would be guided to a large extent by any recommendations that the Director made. He reminded the Conference of the gigantic struggle in which they were engaged. When the war closed successfully, as it must close, they would be faced with greater problems than they had ever faced before, and it was their duty to produce as much as was possible. The men who were coming back from the war, and had come back, would have to be established once more in civil occupations, and as they would be settling in and around the district men on the land should put forth a helping hand whenever the opportunity arose of doing so. They would be faced with a great national debt, and that meant that every man must do his part. That Conference tended in the direction of helping them to produce more than they had ever produced before. He expressed pleasure in having the opportunity of declaring the Conference open.

At the instance of Mr. J. Grove, seconded by Mr. A. V. Mills, the Minister was afforded a hearty vote of thanks.

The opening address was followed by a paper by the Director of Agriculture, who dealt with the question of land soured and rendered unproductive by seepage. After the paper had been read the question was keenly discussed, and a number of questions were asked by delegates, and subsequently replied to by the Director. The morning session was concluded with a paper by Mr. G. Beverley, on the evaporation of fruit, in the course of which the writer of the paper dealt in detail with the evaporation tests that had been conducted on the Pyap Estate.

In the afternoon a visit of inspection was made to a number of holdings on the settlement. The party, which was conveyed in a fleet of motors, first called at the block of Mr. F. R. Arndt, where a great deal of interest was displayed in a recently-installed system of watering by means of underground concrete pipes. From Mr. Arndt's block the visitors journeyed to the Government Experimental Farm, and after a walk through the orchard, a move was made to Mr. W. W. Shand's

block. The areas being cleared for allotment to returned soldiers were then traversed, and a halt called at the co-operative distillery in course of erection.

In the evening Mr. Wilson Francis, of the Waikerie Branch, read a paper dealing with orchard pests and the means of combating them, and that was followed by an address by the Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.), whose subject was "Sand, Paddy Melons, and Stoppage."

Wednesday, May 22nd.

At 10 o'clock a commencement was made, and a paper on "Orchard Irrigation" was read by Mr. F. R. Arndt. That was followed by an address by the Botanical Assistant, who had before him a number of weeds and plants collected during the previous day, and dealt with their characteristics in so far as they concerned irrigationists. The Manager of the Berri Experimental Farm then gave a summary of the work that had been accomplished at that institution.

FREE PARLIAMENT.

The afternoon was devoted to "free parliament," and a number of questions of vital importance to irrigationists individually and to the settlements as a whole were dealt with.

CONTROL OF THE IMPORTATION OF SEEDS FROM NEIGHBORING STATES.

Mr. W. Basey (Renmark), on behalf of the Murray Bridge Branch, moved: "That this Conference of River Murray Branches supports the action of the Advisory Board in its endeavors to secure legislation to provide that seeds from the neighboring States should be subjected to the same conditions of inspection as were imposed on those from overseas." The motion was seconded by Mr. W. R. Lewis, and carried unanimously.

COMPULSORY SWABBING AND SPRAYING.

Mr. W. Basey, of Renmark, introduced the question of compulsory swabbing and spraying of citrus trees. He referred to some of the orchards in the Mildura district that had been completely devastated through the ravages of Black Spot. Compulsion, he thought, was necessary in those districts that were affected. After discussion, Mr. Basey moved, and Mr. W. R. Lewis seconded: "That the Minister of Agriculture should be empowered, on receipt of a request made by a duly convened public meeting of vinegrowers on any area, to declare such district an area infected with anthracnose, and to make the proper treatment of vines in the said area compulsory." The motion was carried.

CITRUS ASSOCIATION.

Mr. F. R. Arndt (Berri), in introducing the question of the need for the formation of a citrus growers' association, read the following paper, giving an outline of the proposed scheme:—It being expedient for the welfare of the citrus growers of Australia that a uniform method of grading, packing, dispatching, and marketing of citrus fruits be observed throughout the Commonwealth and for export overseas, it is desirable that citrus growers form themselves into a co-operative association for furthering these purposes.

That to effect economy in management and to safeguard local interests it is desirable that the citrus growers of each State form themselves into State Branches of an Australian Citrus Growers' Association, each such branch having its State executive officers, and further having the right to elect delegates to a central committee, who with the similarly elected delegates of the other State Branches, shall form the Federal Executive of the Association.

That to help to inaugurate such an Australian Co-operative Citrus Growers' Association the citrus growers of South Australia form themselves into a co-operative organisation, which organisation, by federation or affiliation with kindred organisations of other States, would become a State Branch of an Australian Association. Pending the formation of such a Commonwealth Citrus Growers' Association this organisation of South Australian citrus growers shall take the form of a State co-operative association, having the following obligations:—

Name and Objects.

1. That this association, until such times as by affiliation with kindred organisations of other States it shall have become a branch of an Australian Co-operative Citrus Growers' Association shall be called the South Australian Co-operative Citrus Growers' Association, Limited.

2. That the main objectives of this association shall be to grade, pack, store, dispatch, and sell citrus fruits on behalf of its members or others, and to carry on any business or industry of utility to citrus growers desired by a majority of its members.

3. That for the achievements of its objectives this Association shall raise funds by the sale of shares to acquire machinery, land, or other property.

4. That membership in this association shall be confined to owners or lessees of citrus groves of not less than one acre who have taken up not less than 10 one pound (£1) shares. Five shillings per share must be paid on application, 5s. per share on allotment, and the remaining 10s. per share in calls as required.

5. The capital of this association shall consist of £20,000, made up of 20,000 one pound (£1) shares.

6. Branches of this association may be formed at any place having not less than five members, who shall elect their own local executives to manage local affairs.

7. The general management of this association shall be in the hands of a general executive and of the various local executives. Representatives elected by the various branches shall form the general executive.

8. The general executive shall have power to acquire buildings and working plant necessary for packing, storing, and marketing of citrus fruits, and, if thought expedient, factories for the treatment of fruit into fruit acids, drinks, or peels. The general executive shall further have power to fix all grades, decide upon the proportion of fruit to sell locally, and control the export proportion. The general executive shall have complete control of the sale of growers' fruit, both as regards time and place of disposal, and may establish selling depots at whatever places thought advisable.

9. The local executive, subject to the rules of the association and activities of the general executive, shall have charge of the grading, packing, and storing of fruit at local centres, but must perform same to the satisfaction of inspectors appointed by the general executive.

10. All moneys received from the sale of shares and from calls shall be used for furthering the objectives of the association and shall be under the charge of the general executive. Secretaries of local executives shall collect such moneys and forward same to the secretary of the general executive. Expenses of administration of both general and local executives shall be covered by the selling charges on members' fruit. Moneys received from the sale of fruit to be sent to the secretary of the local executive, who shall forward cheques with account sales to individual growers.

11. The general executive shall have power to deduct 2 per cent. of net value of members' fruit for advertising the sale of association fruit.

Working Policy.

Working along some such rules as here outlined it would be possible to conduct the working policy of a citrus association somewhat along the following lines:—

1. The general executive to appoint a general secretary having an office at Adelaide. The chief duties of the secretary should be to push the sale of association fruit, either personally, or by means of canvassers, and to keep the books of the association.

2. The establishment of a storage depot either at Adelaide, Mile End, or elsewhere. The building should be cool and capable of keeping the fruit in good condition for at least a month. A storeman would be required.

3. Placing some of the fruit during the glut months into cool storage for sale later on in the season. If placed in cold storage the temperature should be kept somewhat above freezing point.

4. The association to deal direct with the retailer, thus doing away with agents' charges.

5. That the management make arrangements to canvass throughout the State all retailers doing any considerable business in citrus fruits, paying special attention to advertise and push the sale of fruit where it is at present but imperfectly known, such as mining and agricultural centres.

6. To further advertise association fruit by hiring a shop window or otherwise making a good display of fruit in one of the main thoroughfares of Adelaide.

7. To ensure equity to growers prices realised during season should be pooled according to variety and grade.

8. Monetary payment to growers could be made monthly or at other suitable periods, on *pro ratu* basis of fruit sold, subject to readjustment on last account sales of season.

On the suggestion of the Acting Secretary of the Advisory Board (Mr. H. J. Finnis), Mr. H. S. Taylor moved, and Mr. F. A. Arndt seconded, a motion to the effect that two delegates from each of the River Murray Branches of the Agricultural Bureau be appointed as a

committee to prepare a scheme for the formation of a Citrus Growers' Association, and that they take steps to place the scheme before the citrus growers of the river settlements; the chairman of the Berri delegation to act as convener. Carried.

ESTABLISHMENT OF A TYPE ORCHARD AND EXPERIMENTING WITH NEW ECONOMIC PLANTS ON THE BERRI IRRIGATION AREAS.

Mr. F. R. Arndt, of Berri, in introducing this question, read the following paper:—Up to the present time fruitgrowing has been the most profitable industry of the Murray irrigation settlements. That the dried fruits industry will probably be faced with the problem of over-production in the future seems apparent, owing to the extensive plantings that have lately taken place in the various irrigation settlements of South Australia, Victoria, and New South Wales, unless more extensive markets for dried fruits are found in the future than those at present existing. Already in normal years there is an over-production of certain dried fruits above Commonwealth consumption, and owing to extensive competition from America and the Mediterranean countries, there is not a very profitable sale for this product on the European markets in normal times. It therefore seems reasonable to believe that if the settlement of irrigable lands is to result in all-round financial success, new plantings will have to consist largely of other classes of plants than those of fruit. No doubt such industries as sheep and cattle fattening, pig-raising, and dairying will yet be extensively carried on on our irrigation areas, especially on the new settlements now being opened up; while even the growing of such grains as maize and barley may, under certain conditions, be carried on at a profit. But if the irrigation industry of Australia is to reach its highest degree of development, it is necessary for the authorities controlling irrigation enterprise to know all the varieties of economic plants that can be profitably grown under irrigation. Although past experience has demonstrated the successful culture of many plants under Australian irrigation conditions, there are still many varieties that are grown on irrigation settlements in other parts of the world that have not yet been given a trial in this country.

Therefore, before all the economic plants that will thrive on our irrigation areas can be known it is necessary that a systematic scheme of experiments should be carried out on experimental stations devoted exclusively to such purposes, where the adaptability of such plants to Australian irrigation conditions would be tested. Even if, as the result of extended experiments, only a few new varieties of plants were found capable of profitable cultivation, the addition to the wealth of the country by the creation of new industries would in a short time pay for the cost of the experiments. New varieties of fruit could be tested either on a separate experimental station set apart for that purpose, or if room could be found to do justice to such experiments, these could be tried on the Berri Experimental Orchard. One of the fruits at present imported into the Commonwealth in large quantities, *i.e.*, the date, should be experimented with to test if varieties suitable to local conditions can be found. To experiment with one or two

varieties only is useless, as the climate or other conditions of the country may not suit these. After experimenting with hundreds of varieties of dates in the hottest parts of California, the American experimenters have reached the conclusion that to ripen its fruit the date must have intense and prolonged heat. Of the two classes, the early and late varieties, the late varieties require more heat to ripen their fruit than do the early varieties; and should experience prove that our autumns are too cool to ripen the fruit of the late kinds, this would, perhaps, not be the case with the early kinds.

Other fruits new to Australian irrigation conditions, such as the pecan nut, which thrives in the warmer parts of the United States of America, the American avocodo (alligator pear), Southern California walnuts, and other kinds of trees, as well as new varieties of the kinds already in cultivation, that is, new varieties of citrus, prunes, apricots, etc., should be given a trial on this experimental station. Economic plants new to Australian irrigation areas should be tested on a special experimental station or stations set aside exclusively for that purpose. Among the plants that should be experimented with are cotton, hemp, flax, rice, and tobacco, the products of which are imported into the Commonwealth in such large quantities, and which, moreover, have a huge world-wide demand. Objection may be raised that plants such as these, which are at present chiefly grown in tropical or semi-tropical countries, where cheap labor obtains, could not be profitably produced under the dearer labor conditions existing in Australia. But as these products have for many years been advancing in price, it is quite possible, with this upward tendency in prices continuing, that some of these varieties could be profitably grown in Australia if the most up-to-date methods of cultivation and labor-saving devices were introduced. That such a useful product as hemp, which is so largely imported into the Commonwealth, should be produced as cheaply as it is in New Zealand seems feasible, if one or more varieties of it were found suitable to Australian conditions. Rice, which is also imported into the Commonwealth in considerable quantities, should offer a favorable field for experiment. During the last few years rice has been largely grown upon the irrigated lands of California. Of the two varieties, swamp and hill rice, the swamp variety would perhaps be found to do well in the low-lying river flats that could be easily and cheaply flooded with water, while the hill variety would probably have a better chance of succeeding upon the high lands of our irrigation areas. Flax is also at present in great demand, with high prices ruling; and should it be possible to produce under our irrigation conditions a good quality of fibre, there seems every reason to believe that a profitable industry could at the present time be established. American advices have informed us that the Egyptian variety of cotton has within recent years been grown at a profit in Arizona with white labor. It therefore seems a possibility that cotton-growing on our irrigation areas could be carried on at a profit at the prices that have been ruling during the past three or four years. There also appears no apparent reason why tobacco should not grow well on our irrigable lands. The heavy pipe tobaccos would perhaps do well on our river flats, while the

lighter varieties, such as the Havannah (cigar varieties) and the cigarette varieties would probably succeed on our sandy uplands. Beside the varieties above mentioned there are probably many other kinds of economic plants at present not grown in Australia whose introduction into our irrigation areas would repay experiment.

The Director of Agriculture pointed out that the Department was faced with the problem of a shortage of funds. The testing of economic plants suitable for those areas might be done gradually, but he did not think the Government would consent to the opening of an experiment station solely for that purpose, but a resolution coming from the Conference would certainly strengthen the hands of the Department. They had already decided to test this year sugar beet on the Experimental Orchard at Berri. Arising out of the discussion, the following resolution was moved by Mr. W. Basey and seconded by Mr. W. Wiadrowski:—"That this Conference desires to express its appreciation of the work now being done at the Berri Experimental Orchard, and requests the Government to extend the scope of its operation as far as possible, and that experiments be conducted with new varieties of plants and grasses suitable for the irrigation areas of the Murray." The motion was carried.

BORING PLANT FOR IRRIGATIONISTS.

The following resolution was moved and seconded respectively by Messrs. E. Miller and H. W. Lehmann (of Waikerie):—"That the Government be asked to supply a boring plant for the use of the settlers on the irrigation areas." The motion was carried.

DANGER OF SPRAYING APPLES DURING JANUARY AND FEBRUARY.

The question of the danger of spraying apples during January and February was replied to as follows by the Horticultural Instructor (Mr. Geo. Quinn). "This matter has frequently come forward, but I wish to state that judging from the results of a number of analyses of sprayed fruit conducted here in this State, I am of opinion that one would need to sit down and eat at one sitting at least a bushel of apples or pears, skin and all, to obtain a fatal dose of arsenic. Some years ago I experimented on apple trees in the Parkside Asylum orchard, spraying them seven times at intervals with Paris green containing equal to 50 per cent. arsenic, using 1oz. in 10 gallons of water (lime). The summer was almost rainless, and at the time of ripening the fruits were practically coated with the lime-wash which had contained the poison. I carefully gathered several pounds of the fruit from different trees, plucking them by holding the stalk only and placing them in glazed paper bags for carrying direct to the analyst. Mr. Goyder, who was then Government Analyst, said that although with the most delicate tests the arsenic could just be detected, it would be quite safe for anyone to use such fruit exclusively for food."

BOOK FOR SOLDIERS—SETTLERS ON THE MURRAY.

On the motion of Mr. E. Miller, seconded by Mr. W. Francis, of Waikerie, it was resolved to ask the Government to publish a book containing Mr. G. Quinn's book on "Pruning," Mr. Lewis' paper on

"Fruit-drying," Mr. Lane's paper on "Fodder-growing," and Mr. McAlpine's bulletin on "Spraying," and other publications of a suitable nature. Mr. Francis pointed out that the number of soldiers now taking up blocks on the irrigation areas should be supplied with such literature as would help them to successfully work their blocks. The motion was carried.

TREES NOT TRUE TO NAME.

This matter was brought forward by the Kingston-on-Murray Branch, and Mr. J. Weatherill moved, and Mr. P. Stubbs seconded, a resolution to the effect that the Government be asked to ascertain the possibility of obtaining compensation from nurserymen who supply trees not true to name. After a lengthy discussion, in which several delegates gave personal experiences of having purchased trees not true to name, the motion was carried unanimously.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, May 8th, there being present Messrs. Geo. Jeffrey (in chair), C. J. Tuckwell, A. M. Dawkins, F. Coleman, Professor Arthur J. Perkins (Director of Agriculture), A. W. Shillabeer, and the Acting Secretary (H. J. Finnis). Apologies were received from Messrs. G. R. Laffer, M.P., and J. Miller.

DISTRIBUTION OF WEEVIL-INFECTED WHEAT.

In regard to the request from the Mount Gambier Branch that the Board should take steps to prevent weevil-infected wheat being taken into the Mount Gambier district, the Manager of the Wheat Harvest Board had reported as follows:—"We have to state that the South Australian Wheat Scheme have been consigning wheat slightly affected with weevil to various parts of the State, including the South-East. The conditions, however, governing such consignments are such that we think should obviate any risk in regard to the spreading of weevil. The consignee in every case is required to see that the trucks used for such wheat are thoroughly disinfected immediately after the discharge of the wheat. We hesitate to take any action that is likely to debar pig-breeders and others from the right to use this class of wheat, as it enables us to dispose of wheat that is rapidly deteriorating in value from the ravages of weevil. We appreciate the action of the Mount Gambier Branch of the Agricultural Bureau, and shall be glad to have any suggestions regarding the elimination of weevil, also as to how the before-mentioned sales of wheat may be controlled, at the same time allowing the buyers the privilege of obtaining inferior wheat at a reduction. No part of the State is entirely free from weevil."

SHORTAGE OF BRAN.

The Secretary reported having directed the attention of the Minister to the difficulty experienced in securing supplies of bran, but intimated

that up till the present no reply had been received in regard to the matter. The Secretary was instructed to see that the matter was expedited. •

DAIRY CONFERENCE.

In response to the request of the Board that approval should be given for a Dairy Conference, to be held during 1918, on similar lines to those on which the Conference was held in 1917, the Minister of Agriculture had intimated that he was considering the question of holding a Conference with a view to discussing a proposal to the expansion of the industry. The Secretary was instructed by the Board to make inquiries as to whether anything had been done in this direction.

NEGLECTED ORCHARDS.

The following resolution was received from the Blackwood Branch of the Bureau:—"That the Advisory Board be asked to urge upon the Government the necessity for taking action to compel owners of neglected orchards either to spray them or cut the trees down, or, if necessary, the Government to do the spraying and charge the owners. The Branch desires to point out that these orchards are the cause of serious loss to the commercial fruitgrower, who is entitled to Government assistance in dealing with what is, in most fruit districts, a public nuisance." The Secretary pointed out that under present legislation it was possible for the Horticultural Instructor to destroy the trees if the owners, after notification, fail to suppress the pest, or he could carry out the steps that were provided for by regulation, and recover from the owner. The Board decided to request that the Horticultural Instructor might supply a report on this matter.

PAYMENT FOR WHEAT.

A letter was received from the Pinnaroo Branch, stating that at a recent meeting the question of a guaranteed price for wheat was discussed. It was pointed out that the present price only allowed a little, if any, margin of profit to producers, and it was generally thought to be certain that unless some extra inducement were offered there would be a considerable reduction in the area placed under crop. The New South Wales Government had promised that wheatgrowers would be paid on the basis of not less than 4s. a bushel at the place of delivery, and members of the local Branch thought the South Australian Government should follow that example. The feeling expressed by the members of the board was that the treatment meted out to the farmers should be similar in all the States. It was decided to ask the Government that the guarantee afforded in the other States should also be offered here.

PROVISION OF RABBIT POISON.

The Carrow Branch of the Agricultural Bureau wrote to the effect that rabbit poison was difficult to obtain, and requested that the Board might take steps to provide bi-sulphide of carbon for the purpose of destroying rabbits. The Secretary reported that from inquiries he had made, supplies of poison were available, and there should be no difficulty in obtaining bi-sulphide of carbon.

BONE MANURE.

The Longwood Branch, in a communication under date of March 23rd, stated that previously to the Wallaroo and Mount Lyell Company

obtaining the contract for bone manure of the Abattoirs, that manure could be obtained at the Gardeners' Supply Stores; now there was a serious shortage, they stated. They requested that the Board should take steps to prevent bone manure being sent away from the State. From inquiries made, it was ascertained that none of the Abattoirs bone manure was being sent out of the State; it was being used for mixing by the manufacturers.

ANNUAL CONGRESS.

It was decided to request approval for a Congress of the Agricultural Bureau to be held in Adelaide in September, as usual, and a committee, consisting of the Director of Agriculture (Professor Arthur J. Perkins), Principal Roseworthy Agricultural College (Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S.), and the Chairman of the Advisory Board (Mr. Geo. Jeffrey), was appointed to supervise arrangements.

THE COMING WOOL CLIP.

On the motion of Mr. Coleman, seconded by Mr. Tuckwell, the following resolution was carried:—"That the Advisory Board of Agriculture regrets that no announcement has been made in connection with the purchase of next year's wool clip, and would urge on the Central Wool Committee the necessity for making a statement of their intentions as early as possible, for by so doing they would relieve the minds of the woolgrowers."

LIFE MEMBERS.

The names of Messrs. W. A. Barnes and E. H. Whitehead, of the Colton Branch, were added to the list of life members of the Agricultural Bureau.

A request for the inauguration of a new Branch at Stanley Flat was considered, but the Board decided that, in view of the fact that a Branch already existed at Clare, a short distance only from Stanley Flat, that the request could not be approved.

NEW MEMBERS.

The undermentioned names were added to the list of members of existing Branches:—Moonta—W. G. Carter, A. J. Weldon; Coomandook—J. Palm, M. P. Wilkin, Upton, jun.; Longwood—H. Teasdale; O'Loughlin—R. Bauman, O. Leahold; Salisbury—L. McNicol; Naracoorte—C. McPhail, B. Lloyd; Booleroo Centre—Jas. Llewelyn, Ed. Wm. Berry; Tarcowie—G. Watkins; Mount Remarkable—H. Goscombe, W. H. Chartier, H. H. Harley, J. Duffield, S. Sparks; Murray Bridge—R. S. Booth; Warcowie—W. J. Shute, E. Jarvis; Netherton—R. H. Cattle; Strathalbyn—R. Heinjus, F. S. Traeger; Meribah—C. G. Ebert, C. H. Nicksch, S. Willsmore; Kybybolite—H. H. Orchard; Minlaton—C. V. Roberts; Kingston-on-Murray—C. D. Dixon, J. L. Wetherall; Coonawarra—G. G. Alder, R. S. Sharam; Riverton (Ladies)—Mrs. A. Hooper; Mypolonga—S. Cheetham, H. C. Prosser, G. M. Hiddle; Cummins—C. H. Koch; Willowie—A. Hughes, T. Hughes, Fred. Blight; Edillilie—F. W. Otto Schulze; Claypan Bore—John Ackins, Alb. Ackins, V. McCormack, W. Burgess, H. Northest; Lucindale—G. W. Långberg, J. Ellison, J. Wallace, H. Carmichael; Brinkley—T. Winter.

DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report on June 1st:—

BUTTER.—Following on the rains of April, nice showers have been experienced during May, so that prospects in the dairying industry are favorable, and already a slight increase in supplies is noticeable, but South Australia has a long leeway yet to make up before we are self-supporting. Fair quantities of imported continue to come along, but in lessening quantities each week, and as Victoria and New South Wales are short of butters, we are now drawing on Queensland to a great extent for our shortage. Values have firmed during the month, "Alfa" selling at 1s. 8½d.; "Primus," 1s. 8d.; second grade, 1s. 3½d.; third grade, 1s. 2½d.; choice separators and dairies, 1s. 5d. to 1s. 6d.; fair quality, 1s. 3½d. to 1s. 4½d.; store and collectors', 1s. 1½d. to 1s. 3d. per lb.

EGGS.—The high rates that have been ruling lately interfered considerably with the demand, and it was not unexpected that values would come back. The lowering has again caused buyers to operate more freely. Refrigerated and well-preserved lots have found rather slow sale. At the close of the month hen sold at 1s. 4d.; duck, 1s. 5d.; refrigerated, 1s. 1d. to 1s. 2d.; well preserved, 10d. to 10½d. per dozen.

CHEESE.—During May the proclaimed prices firmed a penny per lb. for all makes, while supplies coming from the South-East are very limited, and hardly equal to local requirements. Matured, 1s. to 1s. 0½d.; new make, 10d. to 10½d. per lb. for large to loaf.

HONEY.—Much better inquiry has ruled for this line, with values showing a firming. Prime clear extracted selling at 4½d.; second grade slow at 3d. to 3½d.; beeswax saleable at 2s. per lb.

ALMONDS are coming forward in small lots, which are finding speedy quittance. Brandis, 1s. 4d.; mixed softshells, 1s. 3d.; hardshells, 10d.; kernels, 2s. per lb.

BACON.—Although values of the live animal have ruled very high, on the other hand bacon has been very plentiful, and prices have eased, quotations being considerably lower than a month ago. Best factory-cured sides, 10d. to 10½d.; hams, 1s. per lb.

LIVE POULTRY.—Farmers are wisely sending in their surplus poultry in view of the good prices that are ruling. Heavy catalogues have been submitted during the month, but competition has always been equal to clearing and maintaining rates. Heavy-weight table roosters realised 4s. to 4s. 6d. each; nice-conditioned cockerels, 2s. 9d. to 3s. 3d.; plump hens, 2s. 6d. to 3s.; light birds, 2s. to 2s. 3d.; ducks, 1s. 9d. to 3s.; geese, 4s. 6d. to 5s. 3d.; pigeons, 6d. each; turkeys, from 7d. to 9½d. per lb. live weight for fair to good table birds.

POTATOES.—Supplies have offered in fair quantities from the Mount Gambier and Millicent districts, but samples generally in the South-East are not equal to those obtainable in the Gippsland and Ballarat districts, and consequently Victorian sellers have secured most of the Adelaide business. Onions continue to be very scarce, and prices have hardened. Quotations—Potatoes, £4 10s. to £5 10s. per ton on rails Mile End or Port Adelaide; onions, £14 per ton on rails Mile End or Port Adelaide.

THE AGRICULTURAL OUTLOOK.

Booborowie.—Weather—The first week of this month was dry, 45 points fell on the 9th, and showers continued until the 21st. The seeding weather during the last fortnight has been good, the days have mostly been bright and warm; a few frosts have been experienced. Crops—A fairly large area is sown, and some of those crops which were sown before the rain are showing up nicely. Natural feed is plentiful, the green grass has come along nicely, especially along the flat. Stock is in fair condition, but colds and influenza have been prevalent amongst the horse stock. Pests—Foxes have done some damage to the lambs.

Eyre's Peninsula.—The weather has been warm for May. A majority of the days have been very fine and calm. Early in the month a thunderstorm was experienced, registering 60 points of rain, and several cool showery conditions have been recorded since. Up to date (24th), 102 points of rain have been recorded, which is only half the average registered for May during the past three years. Crops—Seeding operations are well in hand, and the month should see practically all hands finished. Approximately 1,500 acres will be sown to cereals in the hundred. Some of the early sown crops have germinated and are showing well. Natural feed is coming away plentifully. Stock—Some digestive troubles have been experienced with stock, but only two proved fatal. Pests—Rabbits are showing about again where the young green is appearing.

Turretfield.—Weather—The first week of the month was very warm, and constituted a record for that season of the year. The first rain was one of 99 points on the 10th, and lighter falls were gauged later, making a total of 214 points for the month. Crops—The rainfall for the month was just sufficient to render the soil in excellent condition for cultivation and drilling. The seed could not have been got in under better conditions, which is in strong contrast to last year, when, after the weather broke, continued heavy rain made the soil much too boggy for favorable seeding conditions. All the crops sown to date show an excellent and remarkably even germination. Natural Feed—Owing to the warming influence of the weather in the early part of the month the grass made splendid headway after the first rain, and already there is a good picking for sheep and other stock. Stock—Horses, although in fair condition, are not looking at their best just now whilst changing their coats. There has been an excellent lambing in the district, and so far foxes have not caused many casualties. Pests—Some domesticated cats have run wild, and made their homes in rabbit burrows. One of these animals was caught in the act of destroying a lamb and making a meal of it.

Veitch.—Weather—We have had good seasonable seeding weather during this month, having received 121 points of rain during the month; Veitch average for same month, 115 points. Towards the end of the month a few frosts were experienced. Crops—All early-sown fields are showing the crop well above ground, and the plants are making splendid growth. A large area in the district is just through the ground, and would now feel the advantage of a good rain. Seeding operations are nearing a finish in most cases. Natural Feed—Stubble and scrub feed has not yet given enough length for grazing. Stock are all in healthy condition. Pests—Rabbits are again on the increase, and means will have to be taken to reduce them. Miscellaneous—Roads in the district have been considerably improved, and should be more satisfactory for general traffic.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall of the subjoined stations for the month of and to the end of May, 1918, also the average precipitation to the end of May, 1918, and the average annual rainfall.

Station.	For May, 1918.	To end May, 1918.	Av'ge. to end May.	Av'ge. Annual Rainfall	Station.	For May, 1918.	To end May, 1918.	Av'ge. to end May.	Av'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.					LOWER NORTH—continued.				
Oodnadatta	0.28	1.31	2.29	4.76	Spalding	2.40	6.75	5.39	20.26
Tarcoola	0.02	3.76	2.14	7.58	Gulnare	2.95	6.23	4.83	19.74
Marree	2.76	4.03	1.82	6.04	Bundaleer W. Wks.	1.88	6.91	4.68	17.29
Farina	2.35	3.90	2.69	6.70	Yacka	2.15	4.64	3.31	15.27
Leigh's Creek	1.92	3.07	3.49	8.66	Koolunga	1.86	4.01	4.86	15.94
Beltana	1.98	3.38	3.70	9.22	Snowtown	1.06	2.96	4.96	15.70
Blinman	1.80	4.53	4.93	12.83	Brinkworth	2.02	5.63	4.45	15.48
Hookina	3.48	4.68	2.99	—	Blyth	2.88	5.57	5.40	16.34
Hawker	2.44	4.46	3.70	12.22	Clare	3.07	7.18	7.61	24.30
Wilson	3.99	4.83	3.59	11.78	Mintaro	2.96	6.79	6.35	21.99
Gordon	1.95	6.05	3.49	10.26	Watervale	3.74	7.23	8.41	27.17
Quorn	1.03	5.09	3.94	13.78	Auburn	2.95	6.49	7.74	24.25
Port Augusta	0.88	3.29	3.50	9.46	Hoyleton	2.05	4.29	5.80	17.96
Port Augusta W.	1.02	3.50	3.13	9.36	Balaklava	2.65	5.90	5.41	16.03
Bruce	0.90	3.19	2.78	10.01	Port Wakefield ..	1.51	3.41	4.98	13.13
Hammond	0.90	3.26	3.63	11.46	Terowie	1.70	4.38	4.17	13.71
Wilmington	0.91	5.13	5.63	18.26	Yarowie	1.51	6.06	4.34	13.91
Willowie	1.21	3.31	3.48	11.90	Hallett	1.53	4.50	4.71	16.40
Melrose	2.12	6.90	7.36	23.04	Mount Bryan	2.03	4.29	4.35	15.73
Booleroo Centre ..	1.63	5.26	4.69	15.83	Burra	1.73	5.10	5.52	17.82
Port Germein	0.86	5.17	4.52	12.84	Farrell's Flat	1.95	4.91	5.74	18.87
Wirrabara	2.17	5.46	5.80	18.91	WEST OF MURRAY RANGE.				
Appila	1.59	4.47	4.83	15.08	Manoora	2.81	6.69	5.49	18.09
Cradock	3.17	4.06	3.31	10.86	Saddleworth	2.44	5.96	6.45	19.69
Carrieton	3.30	5.30	3.69	12.22	Marrabel	3.09	6.65	5.92	18.94
Johnburg	2.05	4.62	3.05	10.21	Riverton	2.61	6.03	6.62	20.48
Eurelia	2.00	4.68	4.00	13.24	Tarlee	2.30	5.39	5.83	17.48
Orroroo	1.79	4.73	4.45	13.42	Stockport	1.85	4.08	5.20	15.89
Black Rock	2.24	4.79	4.07	12.25	Hamley Bridge ..	1.95	4.18	5.39	16.45
Peterborough	2.32	5.07	4.27	13.07	Kapunda	2.54	5.71	6.60	19.67
Yongala	2.04	5.12	3.97	13.94	Freeling	2.29	5.01	5.68	17.85
NORTH-EAST.					Greenock	2.89	6.05	6.57	21.46
Ucoila	2.18	5.45	2.23	—	Truro	2.99	7.58	5.97	19.74
Nackara	2.99	6.53	2.90	—	Stockwell	2.83	7.51	5.81	20.30
Yunta	3.91	6.10	2.97	8.22	Nuriootpa	2.87	6.12	6.26	21.25
Waukaringa	2.69	5.66	2.77	7.94	Angaston	4.00	7.92	6.59	22.25
Mannahill	2.62	5.61	3.04	8.46	Tanunda	2.88	6.10	6.75	22.28
Cockburn	4.00	6.39	3.01	7.97	Lyndoch	2.78	4.84	6.54	23.01
Broken Hill, NSW	3.06	5.87	3.52	9.63	Williamstown ..	3.42	6.07	7.93	—
LOWER NORTH.					ADELAIDE PLAINS.				
Port Pirie	0.93	4.34	4.87	13.21	Mallala	2.28	4.06	5.48	16.88
Port Broughton ..	1.23	2.96	4.73	14.33	Roseworthy	3.30	5.16	5.64	17.81
Bute	2.13	4.03	4.84	15.42	Gawler	2.00	3.60	6.45	19.21
Laura	1.40	3.96	5.37	18.22	Two Wells	1.84	3.30	5.39	16.36
Caltowie	2.00	5.23	4.73	17.27	Virginia	1.86	3.88	5.80	17.68
Jamestown	2.24	5.59	5.13	17.46	Smithfield	2.00	3.64	5.51	17.30
Gladstone	2.22	5.80	4.90	16.00	Salisbury	2.19	5.58	6.23	18.57
Crystal Brook	1.96	4.62	4.96	15.62	North Adelaide ..	3.66	5.96	6.84	21.49
Georgetown	2.48	5.98	5.78	18.32	Adelaide	3.37	5.32	6.97	21.04
Narriby	2.06	4.56	5.28	16.79	Brighton	3.79	6.52	6.33	—
Redhill	2.07	4.57	5.22	16.79	Glenelg	2.26	4.27	5.95	—
					Magill	3.75	6.19	8.27	19.93

RAINFALL—continued.

Station.	For May, 1918	To end May, 1918	Av'ge. to end May.	Av'ge. Annual Rainfall	Station.	For May, 1918	To end May, 1918	Av'ge. to end May.	Av'ge. Annual Rainfall
ADELAIDE PLAINS—continued.					WEST OF SPENCER'S GULF—continued.				
Glen Osmond . . .	3.79	6.91	7.96	25.26	Talia	1.49	2.84	3.54	—
Mitcham	3.25	5.74	7.26	23.47	Port Elliot . . .	1.81	3.12	4.55	16.49
Belair	3.86	6.75	8.97	28.64	Port Lincoln . . .	2.42	3.74	5.93	19.88
MOUNT LOFTY RANGES.					Tumby Bay	1.61	2.89	4.18	15.00
Teatree Gully . . .	3.95	7.31	8.31	28.19	Carrow	1.10	2.24	—	—
Stirling West . . .	5.02	9.51	13.51	46.70	Cowell	0.54	2.48	4.34	11.76
Uraidla	4.79	9.23	13.10	44.35	Point Lowly	0.80	3.17	3.91	12.21
Clarendon	3.00	6.83	10.35	33.67	Cummins	2.12	3.26	—	—
Morphett Vale . . .	2.46	5.30	7.33	23.32	Arno Bay	0.95	2.28	4.16	—
Noarlunga	1.84	4.24	6.43	20.28	YORKE'S PENINSULA.				
Willunga	3.48	6.57	8.17	25.98	Walleroo	1.54	4.25	5.13	14.06
Aldinga	2.60	4.77	6.19	20.34	Kadina	1.93	4.63	5.40	16.88
Normanville	2.60	3.98	6.10	20.65	Moonta	1.74	4.30	5.38	15.22
Yankalilla	3.10	4.80	7.32	22.78	Green's Plains . . .	2.81	4.73	4.87	15.73
Cape Jervis	—	—	4.95	16.34	Maitland	2.08	4.54	6.41	20.08
Mount Pleasant . . .	2.28	5.20	7.82	26.87	Ardrossan	1.37	3.45	4.54	13.89
Birdwood	2.97	5.55	8.30	29.38	Port Victoria	2.25	3.68	5.08	15.21
Gumeracha	3.75	8.23	9.76	33.30	Curramulka	1.79	3.13	5.52	18.50
Tweddale	3.54	7.59	9.74	35.38	Minlaton	2.47	3.92	5.36	17.41
Woodside	4.17	8.33	8.75	31.87	Stansbury	1.44	2.20	5.32	17.06
Ambleside	3.23	6.92	9.64	35.45	Warooka	2.14	3.68	5.31	17.71
Nairne	3.75	7.12	8.53	28.83	Yorketown	2.24	3.71	5.24	17.47
Mount Barker	3.06	8.73	9.29	30.93	Edithburgh	2.19	3.56	5.40	16.48
Echunga	3.51	9.69	10.00	32.83	SOUTH AND SOUTH-EAST.				
Macclesfield	2.68	8.46	8.94	30.72	Cape Borda	3.18	4.65	7.35	25.09
Meadows	4.42	11.34	10.78	35.52	Kingscote	2.83	4.67	5.80	18.95
Strathalbyn	1.66	5.64	6.26	19.28	Penneshaw	2.20	3.34	6.75	21.34
Myponga	3.35	6.53	—	—	Cape Willoughby . .	—	—	6.00	19.99
Millbrook Reservr . .	4.04	8.97	—	—	Victor Harbor	2.68	4.74	6.85	22.18
MURRAY FLATS AND VALLEY.					Port Elliot	2.27	5.39	6.51	20.33
Wellington	1.73	2.70	5.11	15.01	Goolwa	1.63	3.76	6.00	17.93
Milang	1.19	3.95	5.27	16.08	Pinnaroo	2.04	5.60	4.91	16.74
Langhorne's Brdg . .	1.06	2.43	4.78	15.27	Parilla	2.77	5.37	—	—
Tailm Bend	1.76	4.32	4.76	—	Lameroo	3.23	6.24	4.95	15.55
Murray Bridge	1.55	3.31	4.86	14.32	Parrakie	1.86	3.82	4.34	—
Callington	1.32	3.22	5.11	15.65	Geranium	1.83	4.17	5.08	—
Mannum	1.63	3.23	4.21	11.67	Peake	1.66	3.64	5.18	—
Palmer	1.68	3.14	4.56	15.60	Cooke's Plains	2.29	4.36	4.61	14.74
Sedan	1.84	3.89	3.92	11.92	Meningie	2.22	4.45	6.02	—
Blanchetown	0.66	3.54	3.87	—	Coomandook	2.97	4.94	5.31	16.80
Eudunda	2.33	6.83	5.31	17.33	Coonalpyn	2.14	4.48	5.39	17.49
Sutherlands	1.15	4.74	3.00	10.71	Tintinara	3.30	5.74	5.71	18.78
Morgan	1.47	3.20	3.12	10.60	Keith	2.74	4.73	5.64	—
Overland Corner . . .	1.69	2.78	3.98	—	Bordertown	2.90	5.22	5.89	19.76
Renmark	2.03	5.48	3.50	11.42	Wolsley	3.47	5.83	4.42	17.72
Loxton	2.20	3.71	2.89	10.93	Frances	3.10	5.30	4.84	20.74
Swan Reach	1.24	2.88	3.38	—	Naracoorte	2.42	4.46	7.21	23.60
Walkerie	1.93	4.03	2.78	—	Penola	2.74	5.06	8.07	26.73
WEST OF SPENCER'S GULF.					Lucindale	3.65	5.15	6.63	23.32
Eucla	1.53	4.61	4.49	10.13	Kingston	4.58	5.85	7.41	24.73
White Well	1.32	2.36	3.15	9.67	Robe	2.52	3.72	7.38	24.69
Fowler's Bay	1.54	2.79	4.12	12.13	Beachport	3.38	4.90	8.28	27.51
Penong	1.72	2.72	4.16	11.91	Millicent	3.95	6.12	8.84	29.25
Murat Bay	0.94	2.36	2.74	—	Mount Gambier	3.61	5.97	10.00	32.00
Smoky Bay	1.59	2.56	—	—	C. Nrthumberland . .	—	—	8.06	26.63
Streaky Bay	1.67	2.79	4.59	15.31	Kalangadoo	3.37	5.73	—	—

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

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		June.	July.			June.	July.
Amyton	906	—	—	Forster	*	—	—
Angaston	*	—	—	Frances	938	—	—
Appila-Yarrowie	*	—	—	Freeling	*	20	—
Arthurlton	*	—	—	Gawler River	911	24	22
Ashbourne	934	24	—	Georgetown	909	—	—
Balaklava	*	—	—	Geranium	*	29	27
Beaufort	*	—	—	Gladstone	†	—	—
Beetaloo Valley	907-11	24	22	Glenceoe	934-5	—	—
Belalie North	†	22	20	Glenceoe	*	—	—
Berri	918	26	24	Goode	*	—	—
Blackheath	927	22	20	Green Patch	916	—	—
Blackwood	928	17	15	Gumeracha	*	28	—
Blyth	907	—	—	Halidon	919	—	—
Bookpurnong East	*	—	—	Hartley	928-9	—	—
Booleroo Centre	908	21	19	Hawker	*	25	—
Borrika	918	—	—	Hilltown	*	—	—
Bowhill	*	—	—	Hookina	905	18	23
Brentwood	915	20	18	Inman Valley	930	—	—
Brinkley	†	—	—	Ironbank	†	—	—
Bundaleer Springs	908	—	—	Julia	*	—	—
Burra	*	—	—	Kadina	*	—	—
Bute	*	—	—	Kalangadoo	*	8	13
Butler	*	—	—	Kanmantoo	†	22	20
Caltowie	*	—	—	Keith	*	—	—
Canowie Belt	†	—	—	Ki Ki	†	—	—
Carrieton	*	—	—	Kingscote	*	—	—
Carrow	†	20	18	Kingston-on-Murray	*	18	23
Cherry Gardens	928	18	23	Kongorong	918	20	18
Clanfield	927	—	—	Koonibba	917	4	2
Clare	†	—	—	Koppio	917	—	—
Clarendon	934	24	22	Kybybolite	935-6	20	18
Claypan Bore	919	—	—	Lameroo	919	—	—
Colton	916	—	—	Laura	†	14	12
Coomandook	*	—	—	Leighton	†	20	18
Coomooroo	*	—	—	Lenswood and Forest	*	—	—
Coonalpyn	*	21	—	Range	†	—	—
Coonawarra	934	—	—	Lone Pine	†	—	—
Coorabie	*	—	—	Longwood	930	—	—
Craddock	*	—	—	Loxton	*	—	—
Crystal Brook	909	—	—	Lucindale	936	—	20
Cummins	*	22	27	Lyndoch	913	—	—
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Davenport	*	—	—	Maitland	†	—	—
Dawson	*	—	—	Maitland	†	10	8
Denial Bay	*	—	—	Mallala	*	—	—
Dowlingville	915	—	—	Mangala	*	—	—
Edillilie	†	—	—	Mantung	932	18	23
Elbow Hill	*	—	—	Meadows	*	—	—
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				Meribah	*	—	—

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Miltalie	*	22	20	Quorn	†	22	20
Mindarie	*	3	1	Rameo	924-6	—	—
Minlaton	916	14	12	Redhill	*	—	—
Minnipa	*	—	—	Renmark	*	—	—
Mintaro	*	22	20	Riverton	*	—	—
Mitchell	§	—	—	Riverton (Ladies') ..	914	—	—
Monarto South	920	—	—	Roberts and Verran ..	§	—	—
Moonta	*	—	—	Rosedale	914	19	24
Moorlands	*	—	—	Rosy Pine	927	—	—
Morchard	906	22	—	Saddleworth	†	22	20
Morgan	*	22	—	Salisbury	†	—	—
Morphett Vale	*	—	—	Salt Creek	917	—	—
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Mount Bryan	*	—	—	Sherlock	*	—	—
Mount Bryan East ..	*	—	—	Spalding	*	—	—
Mount Compass	*	—	—	Stockport	*	—	—
Mount Gambier	937	8	13	Strathalbyn	934	18	23
Mount Hope	*	22	20	Sutherlands	*	—	—
Mount Pleasant	§	—	—	Talia	*	8	13
Mount Remarkable ..	†	12	17	Tantanoola	*	1	6
Mundalla	*	19	24	Taroowie	907	18	23
Mundoora	910	—	—	Tatilara	938	1	6
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Mypolonga	927	—	—	Two Wells	†	—	—
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Nantawarra	913	—	—	Warcowie	*	—	—
Naracoorte	†	—	—	Warrow	†	—	—
Narridy	*	—	—	Watervale	*	—	—
Narrung	*	—	—	Wepowie	906	22	20
Netherton	923	—	—	Whyte-Yarcowie	911	15	13
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Northfield	*	4	2	Wilmington	907	—	—
Nunker and Yurgo ..	†	—	—	Wirrabara	910	—	—
O'Loughlin	917	19	24	Wirrega	*	—	—
Orroroo	*	—	—	Wolowa	*	—	—
Parilla	†	—	—	Woodleigh	*	—	—
Parilla Well	*	—	—	Woodside	*	22	—
Parrakie	923	—	—	Wudinna	*	—	—
Paskeville	*	—	—	Wynarka	926	—	—
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Penong	918	8	13	Yacka	*	—	—
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Pompoota	†	5, 19	3, 17, 31	Yeelanna	918	—	—
Port Broughton	910	—	—	Yongala Vale	911	21	19
Port Elliot	933	15	20	Yorketown	*	—	—

* No report received during the month of May.

† Held over until next month.

* Formal report only received.

‡ Recess till termination of war.

THE AGRICULTURAL BUREAU.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

AMYTON (Average annual rainfall, 11.82in.).

April 23rd.—Present: 10 members and three visitors.

"THE KEY TO SUCCESSFUL FARMING."—The first step to be taken by the man taking up land, said Mr. H. C. Pitchers, in a paper dealing with the question of "Successful Farming," should be to erect a homestead and farm buildings on a convenient site of the holding. The stables should be erected adjoining the chaff houses, and with the manger extending the whole length of the building. The manger could be 3ft. wide, and constructed of plain galvanized iron, and 3in. x 4in. timber for the front rail, and 2in. x 3in. timber for the back and for the centre bottom beam, to which the iron should be nailed. Posts of either red gum or pine should be placed at intervals of every 7ft. A passage way 8ft. would allow for ample storage room. With the chaff house erected at the end of the stable all the feeding could be conveniently managed. He pointed out that if the stables were erected on a slope, and facing the north-east, they would protect the horses from much of the rough weather, and also the sun would shine direct on to the floor. He laid great stress on the importance of the blacksmith shop on the farm. The farmer was able, with a little practice, to effect many repairs during busy seasons that meant a considerable saving in time and labor. Neither should sheds for the implements and machinery be overlooked. Every farmer should, by careful study, ascertain the best methods and seasons of working his land, and use those quantities and varieties of wheat and super. that would give the best returns for his labor. Most of the rough and windy weather in that district came from the north-west, and south-west. If the wheat was sown from north to south, one would be able to harvest the greater portion of the crop should it be blown down.

HOOKINA (Average annual rainfall, 12in.).

April 23rd.—Present: seven members.

HANDLING COLTS.—The Hon. Secretary (Mr. S. Stone), in the course of a paper on this question, said:—"A work that has to be undertaken on all farms at intervals is the breaking in of farm colts. The first and most important convenience for this work is the possession of a good substantial yard, where the animal can be caught without the least danger of escaping. As soon as a colt finds that he cannot escape, he will immediately turn his attentions to those in attendance, and try to understand their intentions. The catching can be simplified to a very considerable extent and carried out more expeditiously by the use of a crush pen; but as few yards have this convenience, the old method of catching with the rope and pole or lasso is usually resorted to. When the rope is in position on the animal's neck, let it run round, gradually tightening the rope until the colt is made to face you. Still keep the rope tight, and approach it on the near side, with one hand on the rope and the winkers in the other. Rub the winkers about its nose and ears until it becomes accustomed to the feel, and little difficulty will be experienced in getting them in position. Attach reins to off and near side of the winkers, and let the colt run round, first on the near rein and then on the off side, changing at short intervals, so as to mouth equally on either side. In a short time it will be an easy matter to drive the animal around the yard, guiding with the slightest strain

on either rein. Then it can be taken out of the yard and driven about in the open. Should it attempt to bolt on leaving the yard, let one rein loose and let it run round, keeping the other tight until you have it under command. When it can be driven anywhere in the open with ease, put the collar on,* and hitch to a log to teach it to pull. If wanted for single harness, tire it out dragging the log; then take it out, and immediately put it in a dray. Being tired, it will take to the work without making trouble. A wagon team is the best place to give it its first lesson in company with other horses;—but if well mouthed, and taught to draw a log, it can be placed in a breast team without the slightest danger. When released from the team, then hopple, and no difficulty will be experienced in catching on the next occasion. Repeat this for some time, and then the horse will not try to avoid you when approaching with the winkers—a habit that is often found in horses that have been working for years.”

MORCHARD (Average annual rainfall, 11in. to 12in.).

April 27th.—Present: 14 members.

LAYING OUT AN IMPROVED FARM.—Mr. F. Scriven, in a paper under this title, said one of the first points to be considered in the laying out of a farm was to see that a permanent supply of good water was secured, if possible, in the centre of the holding. He suggested that a small paddock, say about 40 acres, should be fenced off around the water supply. That paddock should be oblong in shape. From the paddock six larger enclosures, about equal size, could be fenced off, all adjoining the central enclosure, one on either end and two on either side. That would enable one to work all the paddocks from one point, and facilitate the watering and drafting of stock. In the central paddock a suitable site should be chosen for the house and stables, and a low piece of land selected for the planting of a fruit and vegetable garden. The stable should be nearer the water than the house, or a considerable quantity of dust and rubbish would be blown into the house. He thought it a good plan when building the stable to enclose it on three sides, two of the walls could then be utilised for a chaffhouse and implement and engine shed. Space should be left close to the chaffcutter and manger for a haystack. The pigsties and fowlhouse should be built at some distance from both the house and stables. The delegates to the Conference recently held at Orroroo reported on the proceedings.

WEPOWIE (Average annual rainfall, 13in. to 14in.).

April 27th.—Present: 14 members.

A paper on “How to Help the Farmer” was read by Mr. J. G. Crocker (see page 884, report of the Upper Northern Branches of the Agricultural Bureau). The delegate to the Conference held at Orroroo reported on the proceedings.

WILLOWIE (Average annual rainfall, 11.90in.).

March 29th.—Present: eight members and one visitor.

CROPPING STUBBLE LAND.—Mr. E. Barrett, in a short paper on this question said the best time to sow stubble land was after the first rains had fallen, because most of the rubbish would have germinated. The working of the land should be commenced before the first rain. It was best to cultivate the land very lightly in order that the seed would not be buried too deeply, and to provide for a quick germination. After the weeds had come through, the land should be worked and the weeds destroyed. A bushel of wheat and 40lbs. to 50lbs. of super. should be drilled in very lightly. After the crop had been up a fortnight it could be cross harrowed and most of the rubbish would be killed.

SEEDING.—A paper dealing with this question was read by Mr. E. C. Foulis. The most suitable time to commence seeding in that district, he said, was about the middle of March. Yandilla King was a good wheat for early sowing, as it was a splendid yielder, and not so easily affected with disease as some of the other varieties. Federation was another good variety for that district, but he thought that before sowing one should wait for rain. He would sow about 1 bush. of seed to the acre so that it could be harrowed any time after the rain had fallen, with the exception of that stage when the first sign of green was above the ground.

The wheat was at that time very brittle, and there was a danger of the harrows breaking off the sprout very easily. He advised harrowing after rain all crops sown dry. As wheat for hay he recommended King's Early. It did not grow too rank, and the horses and stock did well on it. Other wheats that had given good returns were Dart's Imperial, Gluyas, and Marshall's No. 3. Another paper on the subject of "Seeding" was contributed by Mr. J. H. McCallum. Many factors had to be considered, he said, as to the correct time to commence seeding. All would agree that it was best to wait for rain in order that the weeds might commence to grow before the cultivator, drill, and harrows were used, but climatic conditions did not always suit that arrangement. Therefore the crop had to be drilled in when the land was dry. He did not think there was any great fear of malting when the soil was dry, but if the subsoil was at all damp the shallower the seed was sown the better it would be. He considered it a good plan to run a light harrow behind the drill in such cases, but when there was no danger of the seed malting there was no need to use the harrow, because when the weeds commenced to appear they could be destroyed by giving the land a good cross harrowing. He thought it was better to risk killing some of the wheat plants rather than not use the harrows, because they generally experienced a spell of dry weather, and the weeds took so much moisture out of the land. He favored the sowing of late varieties of wheat, such as Marshall's No. 3 or Yandilla King, early, and reserved the early wheats for late sowing, because when the winter rains were late, one held back from sowing in order that the weeds might start, and if quick-growing wheats were not used the grain would not mature before the hot weather, and that would mean pinched grain. On the other hand, if the rains fell early one could use the late varieties.

WILMINGTON (Average annual rainfall, 18.26in.).

April 24th.—Present: 12 members.

DOES PICKLING PREVENT SMUT?—A paper on this question was contributed by Mr. H. Farrell.

TARCOWIE, April 23rd.—The meeting took the form of a discussion on the question of "Rotation of Crops."

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 18in. to 19in.).

May 22nd.—Present: nine members and two visitors.

GARDENING.—The Chairman (Mr. A. H. Jacobi), in a short paper dealing with this question, said the fruit-growing in that district had been somewhat hampered by the gardeners having too many varieties of fruit trees. Peaches, apricots, and plums required less care and attention, and also came into bearing earlier than some of the other fruits. When pruning he thought the trees should be cut back hard to cause a vigorous growth, but care should be taken not to keep the tree too much exposed, or the hot sun would blister the crown and white ants would get into the wood. For the destruction of insect pests trees should be sprayed with red oil when the buds were bursting, and a day or so later that could be followed by Bordeaux mixture to destroy curl leaf. Before planting oranges and lemons a plentiful supply of water should be secured, and if that was obtainable the trees could be planted out at a distance of 24ft. from one another. If one wished for good results the land should be well cultivated and the trees properly cared for.

BLYTH (Average annual rainfall, 16.46in.).

March 23rd.—Present: 15 members and seven visitors.

PROVISION FOR HAND-FEEDING STOCK.—Mr. A. L. McEwin expressed the opinion in a paper under this heading that hand-feeding of sheep and cattle was a paying proposition. In that district it was chiefly a matter of the conservation of hay. It was a singular fact that oats were not grown to any extent by the majority of farmers; that was no doubt due to the fact that wheat was more readily turned

into cash. He was of the opinion that oats could be grown to better results than wheat at the present market prices. When cutting the oat crop for hay care should be exercised to see that the crop was cut at that stage at which a good proportion of grain and good straw would be secured. He did not see why, with careful feeding and handling, they should not secure two lambings each year. That point, he considered was one that would make their farms more profitable. In the past they had been able to dispose of large quantities of their hay to the neighboring States, but with the increased areas being worked in those States they should look to their own farms, and dispose of the surplus hay in the form of beef and mutton. Australia was without doubt one of the best-suited countries in the world for stock-raising. During summer or winter it was not necessary to house the stock, and by conserving fodder for use during dry seasons of the year the stock-carrying capacity of the farms would be increased to a considerable extent. His experience had taught him that hay was one of the cheapest means of conserving fodder. The year of drought, 1914, should teach them all the lesson of the need for the conservation of feed for the stock. He advised the sowing of an area of 50 acres of oats each year on stubble land to be stacked as surplus fodder. Algerian oats sown with King's Early wheat, would make an excellent food ration. He felt sure that by combining wheat-growing with stock-raising they would be in very much better positions than if they confined their efforts solely to the growing of wheat.

BOOLEROO CENTRE (Average annual rainfall, 15.83in.).

April 26th.—Present: 11 members.

SEEDING OPERATIONS.—One of the first things to attend to before commencing seeding, said Mr. W. Mills, in a paper under the above heading, was to see that the drill and cultivator were in good working order. If the horses were brought in a week or so before commencing work they would be in much better heart for the work before them. As to the correct time at which to commence seeding, the farmer should use his own discretion, but for that district about the middle of April, he thought, was a reasonable time. It was always advisable to work the land wet if possible, and then the crops would stand a dry, windy spell in the spring a lot better than on land worked dry. He believed in cultivating the land well before drilling, as it gave the seed a good bed, and it would come up better. If the land was wet he had found it a good plan to harrow after the drill, as that seemed to set the ground firmer around the grain, and it would also come up faster, especially if a dry spell set in, but if the land was dry and the grain covered the harrows were not needed. If the fallow was well cultivated in the spring beforehand it made seeding easier, and there would not be the trouble with stinkwort and other summer weeds which generally started in the spring, and could be destroyed by cultivating. Of course there would be some weeds, but they would not be so plentiful, and the land itself always worked a lot easier. Good seed should be selected for sowing, and it was always advisable to use pickle. He strongly favored the method of pickling wheat by shoveling the grain on the floor, and mixing the liquid with it. The quantity of seed and super. to be sown also depended on the class of soil that the farmer had to work. A lengthy discussion followed, and Mr. Whibly, in indorsing the comments, stated that seeding time was more important than at harvest, for if farmers were not on the right lines at seeding time they could not expect good returns at harvest time. All members were in sympathy with the paper, and thought that if farmers followed the rules set out therein they would not be far wrong when harvest time came round.

BUNDALER SPRINGS.

April 24th.—Present: 13 members and one visitor.

GENERAL FARMING.—Mr. Travers, in dealing with the subject of "General Farming," remarked that the most important thing to consider in choosing a farm was the price of the land. The stables should be warm in winter and cool in summer, and a stone wall and straw roof structure was undoubtedly the best. The building should face the east or north-east, having stalls large enough for one horse only. He did not believe in tying horses up in the stable. In respect to working the farm, he once believed in deep ploughing, but now preferred shallow ploughing with a fine, well-worked seed bed. The harrow was one of the best implements on the farm, but should not be used on dry ground. To use the harrows two days after seeding was a good plan for killing star thistles. Rolling after

seeding was also advocated to tighten the soil round the seed. In considering harvest operations, Mr. Travers said that hay cleaned the farm, and he thought there was more money in hay at 25s. a ton in the stook than in wheat at 3s. a bushel. The most important thing was not to depend on one product only. Time should be devoted to stock-raising, particularly sheep. They were very little trouble, and could be kept profitably. Large-framed, rough sheep would do better than the finer woolled breeds. If they could feed all the wheat to pigs they would receive better returns than by taking it into the wheat buyers, and the same remark could be applied in feeding hay to sheep. A considerable amount of discussion followed, in which Mr. O'Dea considered that every horse should be tied up in the stable. Each horse was then able to get its fair share of the food. He preferred deep sowing of seed in a dry year, but would not sow more than a bushel of wheat to the acre. Mr. Ellis preferred the horses in stable to be loose, and able to drink whenever they felt inclined. Mr. P. Kerin would only water horses twice a day. He preferred sheep with wool of a good length. The wrinkles in the neck were not desirable, because they held the grass seeds. Mr. Cronin related his experience of thick sowing of seed, and found that he reaped a better crop by it. He considered more manure should be sown with the crops. Mr. J. Daly thought that thick sowing would pay all right if the spring were wet, but for ordinary years his experience showed that a bushel to the acre was sufficient. In answer to questions, Mr. Travers recommended sowing to a depth of from 1½ in. to 2 in. at the present time. If the ground was damp and in good order the seed need not be sown so deeply. He considered 80 lbs. of wheat could be sown in that district, as the soil would carry it. He only used 40 lbs. to 50 lbs. of super. He strongly favored cross drilling, especially with oats and wheat sown for hay. In sowing lucerne, he advocated the month of April if rains came in time, but did not think it should be sown later than August. Mr. O'Dea recommended sowing in the first week in October in well-worked ground. Mr. Cooper found that lime sown with lucerne gave good results.

CRYSTAL BROOK (Average annual rainfall, 15.62 in.).

April 27th.—Present: 14 members.

SHEEP ON THE FARM.—Mr. Ben. Weston, in a paper on this question, said that during the year 1916 he purchased 200 three-year-old ewes from a northern station at 22s. 6d. per head, and four rams—two English Leicester and two Shropshire—at £4 4s. each. The rams were put with the ewes about the middle of October, and left with them until June of 1917. The first lambs were dropped in March, and the Leicester cross were the first to mature. During August of 1917 he marketed his first spring lambs, and they realised 25s. 6d. per head. Another lot was marketed in October, and they brought 26s. He also sold 22 lambs that he had intended to keep for breeding purposes for 28s. each. Later on in March he brought in a draft of fresh lambs that weighed about 40 lbs. dressed, and received 28s. 6d. per head. At the same market there was a lot of heavy Shropshire cross lambs, and they brought 30s. On asking the buyers why there was only such a slight difference in the price of the two lots he was told that in Adelaide, when a customer asked for a leg of lamb he, as a rule, wanted one that would weigh about 4 lbs. or 5 lbs. The legs from the larger lambs would weigh up to 7 lbs. and 8 lbs., so that it would have to be sold as mutton, and that would mean a loss of 2d. or 3d. per lb. compared with the price of the lamb. From the 220 ewes that he had at the commencement of last season 250 lambs had been reared, and 196 were sold for £267, and the wool realised £134, making a total of £401. His returns for the 12 months had been £1 16s. 6d. from each ewe. The delegates who attended the Conference of Mid-Northern Branches delivered a report of the proceedings.

GEORGETOWN (Average annual rainfall, 18.32 in.).

April 29th.—Present: nine members.

CARE OF THE HORSE.—Mr. G. Hill in a paper on this question said if one wished to keep the horses in good health they should be very closely watched in order that one might detect at once any illness from which they might be suffering. Should anything be wrong with the eyes, advice should be asked of someone who was interested in horses, and probably the sight of the animal would be saved. If one noticed that a horse was continually dropping his food one could nearly always tell that the animal's teeth needed attention. Horses with bad teeth were generally

also those that suffered with colic. The animal should be drenched during the early stages of the complaint. Should a horse have a lump on the chest or shoulder it should be watched daily, and when one could feel a soft place, a knife should be used. The small blade of a good clean pocket knife would be found to be a useful instrument. Open the skin up to a depth of about lin., and allow the matter in the lump to drain. He advised members to seek advice through the Government Veterinary Surgeon; such advice was always freely and willingly given.

MUNDOORA (Average annual rainfall, 14.11in.).

April 22nd.—Present: nine members.

The meeting took the form of a discussion on the question of "Early and Late Sowing of Wheat." It was generally agreed that if the rain held off it would be safe to start sowing clean fallow, but if dirty ground had to be sown it would be best to wait a few weeks because the danger of being late was not so great as that of a dirty crop. Mr. Wilson had found that the wheat sown late last season was badly affected with red rust. Mr. Fuller reported on a mid-season wheat, Currawa, that had yielded well in the Yacka district for the past four seasons.

PORT BROUGHTON (Average annual rainfall, 14.44in.).

April 5th.—Present: 10 members.

MANURES.—The Hon. Secretary (Mr. J. H. Fletcher) read an article on the subject of "Manures," and a good discussion followed. Various stock ailments were discussed, and also the best methods for dealing with stinkwort.

WIRABARA (Average annual rainfall, 18.91in.).

April 27th.—Present: 14 members and one visitor.

HANDLING YOUNG HORSES.—No hard and fast rule could be laid down, said Mr. J. Hollitt, in a paper on the question of the handling of colts, that would apply to every horse, because colts were of different dispositions. There was a marked difference between the disposition of the farm and the station-bred horses. The former were generally bred from mares in constant use on the farm; hence they were generally stable-fed, and the foal became so accustomed to the driver feeding the horses, harnessing and unharnessing his team, that the foal had no fear, and became as quiet as its mother. Especially would that be noticeable if the driver was fond of horses, because he would often caress the foal and a confidence would be established between them. There should be no difficulty in catching colts that had been reared in that way; many of them would allow the person that they were accustomed to place a rope around their neck without any trouble, but if the foal persisted in turning its rump towards one, and showed any inclination of kicking, he should be punished by a hard stroke or two with a whip. When placing a rope on a colt care should be taken to see that it was strong enough to hold him, because if the colt was allowed to break loose and get away the first time it would try to do so a second time. Colts that were of a wilder nature needed different treatment from those referred to above. It was necessary to establish confidence between the master and the colt. First of all one should have a good substantial yard, one in which the colt would have no chance of jumping or hurting itself. A good handy whip was needed with a fairly long handle, but it should not be used unnecessarily. The operator should make the colt face him, and then rub the face of the animal with the whip handle. On no account should the colt be struck whilst it was facing the operator. When he was able to stand quite close to the colt it should be spoken to kindly and with words of command and it would very soon understand and learn to obey. For mouthing the animal, a mouthing bit on a halter should be reined to a surcingle, care being taken to see that both reins were of the same length and tightness. For a few hours the colt should be left in the yard in order that it might become accustomed to the feeling of the bit. It should then be induced to follow the operator about the yard, and with a little perseverance and patience it would soon understand what was required. The colt's feet should then be picked up, and to do that one should take a firm grip of the mane or wither with one hand and pass the other hand right down the shoulder and leg to the fetlock. When once the leg had been raised off the ground the colt should not be allowed to put it down again if it could possibly be prevented. To raise the hind feet one should commence by rubbing the colt down the back. One hand should

be kept on the back and the other passed right down over the rump and on to the fetlock. If that was done carefully little trouble should be experienced, because the colt would already have confidence in his master. Should the colt prove vicious its leg could be raised by fastening a rope around the leg and passing it over its back. By a steady pull the leg could easily be raised and held in position. That system of handling the animal should be carried out for two or three days. It should next be lunged out in a paddock, first of all with the rein on the near side, then the off side, and finally driven with both reins. If the colt was a draught animal, he preferred to work it first of all in the body of the team. A rope should be placed around its neck and run through the bit ring and fastened to the leader's chain. He would change the position of the colt in the team in order that it might become accustomed to working in different positions. In a discussion on the question of the best varieties of wheat for hay in that district Yandilla King and Lott's were recommended.

WHYTE-YARCOWIE (Average annual rainfall, 13.91in.).

April 18th.—Present: seven members and 10 visitors.

LECTURE.—The Superintendent of Experimental Work (Mr. W. J. Spafford) delivered an address, in the course of which he emphasized the value of experimental operations on the farm under purely local conditions.

BEETALOO VALLEY, April 23rd.—Mr. G. L. Wishart (Orchard Inspector) attended the meeting of the Branch, and delivered an address on "Orchard Pests, and the Best Means for their Destruction."

YONGALA VALE, April 27th.—The Hon. Secretary (Mr. G. J. I'Anson) read a paper on "The Use of the Binder and Thresher." The opinion of the members was divided. Some thought the only way to prove the value of the machine would be by a practical test.

LOWER-NORTH DISTRICT. (ADELAIDE TO FARRELL'S FLAT)

GAWLER RIVER.

April 22nd.—Present: 12 members and three visitors.

SOIL FERTILITY.—In a paper dealing with the subject of the "Fertility of the Soil" Mr. Aitchison said:—"In many parts of this State, particularly on the heavy rich soils, it has been found that crops seldom yield grain in proportion to their growth and general appearance. In the attempt to rectify this, it has been the practice to reduce the customary application of super. This, however, will not give the desired results. It will only reduce the total yield. It is an over supply of nitrogen that leads to excessive growth of straw and flag. Scientists have decided unhesitatingly on certain facts in connection with plant growth. These should be thoroughly realized, otherwise crop results may be misread. One is the accepted fact that of all the elements that go to make up the growth of a complete plant, only three essentials are necessary to consider when artificial application of fertilizers is concerned. They are nitrogen, potash, phosphate, and occasionally lime. Another is the "law of minimum," that is to say, a soil deficient in any one of these elements will become more or less infertile no matter what excess there may be of others, implying that plant development is regulated by the available supply of that essential food element that is present in the soil in the least amount. A third is the particular action of these essentials, which action is very clearly explained, particularly in regard to phosphate and nitrogen by A. D. Hall, the most prominent modern authority on the subject. He says:—"In the first place nitrogen is mainly concerned with the vegetative growth of the plant; with the formation of leaf and stem that are the preliminaries to complete development. A deficiency of nitrogen results in a stunted general growth in which the grain or seed bears a high proportion to the whole weight of the crop. The other necessary elements, phosphoric acid, potash, are only taken up by the plant as it can use them, i.e., in

quantities proportionate to their growth. As the amount of available nitrogen is increased, the development of leaf and shoot increases, the color deepens, and maturity tends to be more and more deferred, so that a crop grown on land over rich in nitrogen, always tends to be late, badly ripened, and a profusion of leaf; characters which, in the case of a grain crop, often results in the crop going down badly before harvest. Just as nitrogen always delays maturity by promoting growth, phosphoric acid has the opposite effect. It is in some way closely bound up with the grain formation, being always found in greater proportions in the reproductive parts of the plant than elsewhere. The phosphoric acid increases the proportion of grain to straw, its action is not confined to its ripening effects, it stimulates the early development of the young seedling to a remarkable extent. Farmers are well acquainted with the good start that any crops get when manured with superphosphate. It also causes a much enhanced development of lateral fibrous roots. Reverting to the fact that our soils, our rich ones in particular, give more straw and flag in proportion to grain: this fact has been frequently commented on by those who have in other countries seen much larger yields of grain from crops showing less straw and flag than ours. So far no attempt has been made to overcome this. A reduction in the amount of phosphate applied, the only remedy hitherto adopted will not meet the case, but only results in a lessening of the whole crop. That little or no nitrogen is applied artificially under our system of agriculture inclines to the belief that the crop yield is governed by the fertilizer generally used, that is phosphate. Although nitrogen is not applied artificially, of course the crop must obtain its requirements of this necessary element all the same. Australian farmers are most favorably situated in this respect. Throughout Europe immense quantities of nitrogen, the most expensive as well as most soluble of fertilizers and most liable to be washed away, are used in combination with phosphate. Then if the wheat crops in Europe must be dressed with artificial nitrogen, and in Australia it is unnecessary, whence does the crop obtain it. Our soils are rich in nitrifying bacteria, and our conditions are excellent for their development and multiplication. Stable manure contains myriads of these bacteria, and provides a certain amount of material for them to work upon. Without the aid of these bacteria there might be large quantities of nitrogen in the soils, and yet it would be useless for plant growth. The nitrogen must be in the form of nitrates to enable the plant to assimilate it, and that is the function of these bacteria. They convert the nitrogen into nitric acid. Their work is finished with this process, and all their work may be rendered of no value if there be no suitable substance available with which the nitric acid may combine. It has long been known that where there is plenty of lime present, bacterial action is better, as the lime, combining with the nitric acid formed by the bacteria, produces nitrate of lime. The lime in supplying the base with which the nitric acid can combine thus presents a nitrogenous compound in a suitable form for plant assimilation. It also, as a matter of course, keeps down the accumulation of nitric acid in the soil, for if the nitric acid accumulates the bacterial action stops. These facts have long been known, but it is also now known—and this cannot be too strongly emphasized—that if there be a sufficient quantity of tricalcic phosphate in the soil in a suitable condition (tricalcic phosphate, that is three parts lime combined with one part phosphate, and is the form in which phosphate occurs in bonedust, guano, and rock phosphate, and in this condition is not available to plants, and a suitable condition means a very fine state of grinding or subdivision). Nitric acid acts on this tricalcic phosphate, and forms both soluble phosphate and nitrate of lime; the form in which these essential elements are assimilated by the plant. The importance of the process when thus understood cannot be over-estimated, and assists materially in explaining the why and wherefore of the success derived from the use of insoluble phosphates. Superphosphate has become the popular and generally supposed indispensable fertilizer for this State; but if we again refer to A. D. Halls' statement of the action of phosphate it appears that in the endeavor to, in his words, 'stimulate the early development of the seed,' we have neglected the more important duty of furnishing an ample supply when grain-forming takes place. Further, in purchasing superphosphate one buys phosphate in its most expensive form, and further still, if the farming methods of this State—which are necessary in the first place to conserve moisture, and then encourage bacterial activity—if this method will, at the same time enable the soil bacteria to act on insoluble phosphate so as to make it readily assimilated by the plant, it were well to keep the soil well supplied with insoluble phosphate in its

cheapest form, as in phosphate powder. In this manner a surplus of phosphate will be present which will enable the crop to take full advantage of an abundant supply of nitrogen, and if not in too soluble a form will not encourage too rapid a growth in the earlier stages of plant life at the expense of its final complete development. A well-known authority is credited with the statement that 'the value of a fertilizer is in proportion to its solubility.' This, however, is not so, otherwise bonedust is of no value. A correct version is 'that the value of a fertilizer is in proportion to its availability.' That availability is variable depending mainly on the condition and constitution of the soil. Bonedust in combination with super, has been used for many years with the greatest satisfaction. Its yearly increasing price, has, however, interfered with its continued use. Over extensive areas it has now been proved that the availability of bonedust is equalled if not exceeded by finely-ground phosphate powder. The supply of all phosphatic manures except phosphate rock is yearly getting less, and it is fortunate that in addition to its value for superphosphate-making it is now found of equal value to bonedust, and its use untreated yearly increasing. On the strong, rich lands previously mentioned and on soils in the districts with fairly heavy rainfall, particularly those in the South-East, a distinct improvement in the returns will be noticeable if the use of super, alone is discontinued, and a mixture of phosphate powder and super, in about equal quantities is substituted. This will neutralise the acidity always associated with super, and also assist to correct the acidity of the soil. It is an established fact that in order to obtain the most satisfactory results from the use of super, the soil must contain a sufficiency of lime. On the other hand a continued use of super, on soils lacking in lime will result in the appearance of sorrel, and if long continued the sorrel will so increase as to leave the soil quite unsuitable for useful vegetation, and show an entire lack of the clovers, the presence of these useful plants being an infallible guide whereby to gauge the fertility of the soil."

LYNDPOCH (Average annual rainfall, 23.01in.).

March 28th.—Present: 15 members.

Mr. G. L. Wishart (Inspector of Orchards) attended the meeting, and delivered an address on "The Formation and Planting of an Orchard." At a later meeting, held on April 25th, the Chairman (Mr. F. Moore) read an article on "Post War Problems."

NANTAWARRA (Average annual rainfall, 15.90in.).

April 25th.—Present: nine members.

WHEAT-GROWING VERSUS SHEEP-RAISING.—A discussion on this question was initiated by Mr. F. J. Sutton, who said if one considered the price of labor, super, bags, and twine, and everything connected with the growing of wheat, and compared it with an average yield of, say, 15bush. or 16bush. per acre, only a small margin would be left for the grower. Another difficulty that he had to contend with was the fact that they were unable to secure a straight-out settlement, as was the custom in pre-war days. The sheep-farmer on an ordinary holding could manage most of the work connected with his flock alone, perhaps with the exception of tailing the lambs and the shearing of the sheep. The 10 per cent. which was held by the Government on the sale of the wool seemed very small against the time the wheat-grower had to wait for his returns. He was also able to market his fat sheep and lambs, and receive an early settlement. Mr. P. Nottle said his idea was that the wheat-growers were all hanging on in the hope of the war ending, and that once over, and a rapid fall in freights, he would be able to look forward to a better time owing to the scarcity of foodstuffs in those places where the war was raging. Mr. R. P. Uppill considered that the grower of wheat was having a bad time. He would be giving his land a spell until such times as conditions warranted a return to wheat-growing. Many people were of the opinion that it was only possible for the farmer to grow wheat. Here was the opportunity to prove to them that such was not the case. The prices of both wool and mutton would, for some time to come, be comparatively high on account of the great demands for both commodities.

RIVERTON (LADIES') (Average annual rainfall, 20.48in.).

April 23rd.—Present: eight members and one visitor.

THE COW ON THE FARM.—Mrs. Wm. Lock, in a paper on this subject, expressed a preference for the practice of feeding the cows whilst they were being milked, because they then gave the milk down better. The animals should be fed at regular hours, and with good food, such as a kerosine tin full of damped hay chaff, one handful of pollard, and three of crushed oats or bran. With such attention and food a good cow would keep in condition and return a profit to her owner. Quietness in handling was almost an essential for the milk cow. She should be allowed to stand for a while after being brought in from the paddock. Where there was a number of cows and the service of more than one person was required each cow should be milked by the same milker. She gave preference to the Jersey cow, because an animal of that breed was of a quiet disposition, and the milk contained a large percentage of rich cream. It was a mistake to buy cows for dairy purposes out of the markets, as it was very seldom that people sold a good cow there. One often heard it remarked that keeping cows was not a payable proposition. She was convinced that those people only had very poor cows, or they did not understand the management of the cattle. She had proved that they would give very profitable returns if they were well cared for. One could not expect a cow to give good results if she was kept in a bare paddock or where there were sheep. Green feed, such as sorghum or lucerne, should be provided for the cows during the summer months. To make the cows pay the returns of the animals should be closely watched. For instance, say one had two cows, both being fed the same, one might be giving 5lbs. or 6lbs. of butter more than the other. In that case the poorer cow would be eating the profits of the other. In other ways, besides the production of butter, the cow was a valuable asset to the farmer. The separated milk with a little boiled linseed would soon fatten the calves and pigs, and if the waste milk was curdled it was good food for young turkeys. During the present year she had reared 40 young turkeys on that diet. She had kept careful account of all expenses incurred in the handling of her cows, and at the end of the year they had returned a handsome profit. There had been no store accounts, because the cows had kept everything going, and it was one of the things that women could undertake and manage successfully on the farm.

A WOMAN'S PART ON THE FARM.—Mrs. Paul Schultz, who contributed a paper dealing with the above question, said it behoved every woman to assist in the production of the farm and to keep the expenses down. It was a good plan to take up poultry-keeping. That could be well managed by the women folk, and besides breaking the monotony of indoor life it provided an interesting and profitable hobby. A farmer's wife with a well-managed poultry run would have no trouble in keeping the grocer's account in hand. Other sidelines on the farm, such as a vegetable garden and cows could be managed by the women folk. They did not expect to be successful right from the start, but with the help of the Bureau she felt certain they would do better in the future than they had done in the past.

ROSEDALE.

April 24th.—Present: 13 members.

CULTIVATION OF FRUIT TREES.—Mr. J. M. Carrol, who contributed a paper dealing with this question, said it frequently happened that trees after bearing crops of fruit for a number of years became exhausted and failed to bear fruit. In many cases, provided the tree was not too old it was possible to bring the tree back to fruitfulness by the adoption of certain methods. It was necessary to supply the trees with manure, and at the same time the work must be done with care, because an over supply of organic manure was often conducive to fruit trees making an over luxuriant growth. The best way to feed the trees was by giving them a dressing of some approved artificial manure during the autumn or early winter, which should be forked into the ground over the roots. There were various kinds of basic slag or calcareous substances used for that purpose, but they should be applied early in autumn, say February or March. Bonedust was also best applied in that manner. The amount to be used would of course vary with the type of tree, class of soil, and climatic conditions, but a good working quantity would be about 2lbs. or 3lbs. per tree, scattered evenly over the surface of the ground some distance from the stem, say about 3ft. In addition to that the fruit trees would greatly benefit

by a good mulching of rotted stable manure. That was best applied in the early summer when the crop of fruit had set, for at that time it would be of most assistance in making the fruit swell. If a good watering was given after the manure was applied the manurial constituents would wash well down to the roots of the trees; that which remained on the surface would keep the soil moist and cool during hot, dry weather. In dealing with very old trees it was necessary to make a trench around the tree about 4ft. from the butt and entirely remove the soil, for to do any good it was necessary to replant the roots in fresh and properly-prepared compost. Soil taken from a site that had not been used to any extent and mixed barrow for barrow with the sifting of a rubbish heap with a small addition of bone manure was the best to use for that purpose. If a quantity of old plaster or mortar rubble was handy it should be added; it would improve the mixture. If that was unobtainable lime, either quick or air slaked, should be used. That compost should be placed in the trench and made firm. The roots would make a fresh start, and would soon give the tree increased vigor and fruitfulness.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

BRENTWOOD.

April 25th.—Present: 10 members and two visitors.

SEEDING.—Mr. A. E. Twartz, in a paper on the subject of the time for seeding, said when seeding was started before rain fell the land was light to work, and the drill covered the seed well, but during a year when there were no summer rains the weeds were not killed, and there was a great risk of the grain malting. Oats, if sown for hay, should be drilled in before rain, because they would grow a heavier crop of straw. A late barley crop was more profitable than one sown before rain, because it gave a better sample of grain, and the rough weather would not affect it so much. Some farmers did not wait for rain to come, because they thought it would make the seeding so late. If rain came about May 20th, and the average farmer had, say, six weeks seeding, he would be much better off than he who sowed without rain. He would be able to destroy the weeds, and the grain would immediately commence to grow. In that district, where a considerable area was put under barley each year the wheat should be sown first. The barley could then follow, and seeding would be finished at the end of June. If the rain happened to be later he would still wait until it came, and if it was impossible to sow all the crop the balance of the land could be left for fallow and the seed and super. held over for next season. Mr. Honner agreed with the paper. Last year he started seeding before the rain, and the result had been that some so sown was not worth reaping owing to rubbish, &c. Mr. Nation said he had a paddock of 70 acres, 40 of which he had sown dry, but the result was very poor indeed. The other 30 acres were sown after the rain, and turned out splendidly. He also concurred with the writer of the paper. Mr. C. Newbold cited a case very similar to that mentioned by Mr. Nation, and thought it best to wait if the fallow were dirty. However he considered May 12th quite late enough for any farmer to wait, unless he had plenty of help and horses. Mr. Twartz, in reply, said that presuming the rain did not come until late in May, he considered that the crop sown after the rain would be better than those sown earlier in a dry state.

DOWLINGVILLE (Average annual rainfall, 13in. to 14in.).

April 3rd.—Present: eight members and two visitors.

HAND FEEDING OF SHEEP.—The question of hand feeding of sheep, said Mr. J. A. Phelps, in a paper under the above heading, was one that farmers should consider if they wished to keep up the standard of their flocks. If the sheep were given hay chaff or headed straw during those periods of the year when green feed was scarce it would help to keep them in condition. The breeding ewes should be fed for some time prior to the lambing season, but care should be taken not to overfeed them, or a number of lambs would be lost. While they were carrying lambs, he had been in the habit of giving them about ½lb. of chaff per day per sheep. When the ewes had a lamb at foot they should be kept in a paddock by

themselves and fed with about 2lbs. of chaff each per day. Should they not do well on that ration the chaff could be slightly reduced and a small quantity of either crushed oats or barley mixed with it. If the wethers were forward stores they could be given about 1lb. of hay chaff each per day. On that ration they should be ready for the butcher in about six weeks. The hoggets would not fatten so quickly, but that quantity of feed would keep them in good condition, and help them to grow a good fleece of wool. From April 1st to June 30th he had hand fed 118 ewes in lamb and 82 hoggets, and had used on an average 250lbs. of chaff per day for the 200 sheep. He was firmly convinced that there was more to be made out of the hay by feeding it to the sheep than by selling it. Before starting to hand feed his flock he had kept 120 sheep, but since adopting the practice above referred to, he had been able to increase his flock to 200 sheep.

MINLATON (Average annual rainfall, 17.41in.).

April 19th.—Present: six members.

THE CARE AND MANAGEMENT OF SHEEP.—Mr. Jas. Martin, in a paper, dealt with this subject from the point of view of the farmer who only kept a small flock. The present prices ruling for sheep and wool should induce every farmer to give his flock the best attention. One of the main points in the successful handling of the small flock was that the sheep should have a change of pasture. Not only should that be done to enable the feed to keep sweet and fresh, but because many of the diseases contracted by sheep were caused by keeping the sheep too long in the one paddock. Plenty of good drinking water was also an item that should not be overlooked. If possible when lambing season was drawing near the ewes should have a small paddock to themselves. The class of sheep to keep, of course, depended on whether one wanted to get wool or mutton. If wool, the Merino should be selected; for the latter a Merino cross mated with a Lincoln or Leicester ram would be found a good cross. In the discussion that followed, Mr. Correll thought more should be done in the way of hand feeding of stock. With crops like those received last harvest enough hay could be cut off a few acres to keep a number of stock. Mr. Vanstone said feeders for sheep should have a wind-break around them, otherwise some of the hay chaff would blow away. The fox was accused of killing numbers of lambs, and bells on the sheep and hurricane lanterns in the yard or small paddocks where the lambing ewes were enclosed were mentioned as protective measures, but no member had had any experience with those devices. Mr. Vanstone had obtained good results by poisoning the entrails of fowls.

WESTERN DISTRICT.

COLTON (Average annual rainfall, 17.01in.).

April 8th.—Present: eight members.

Mr. F. Shipard, with the use of two glasses half full of water and a small quantity of wheat in each glass, demonstrated the difficulty of thoroughly wetting the wheat that was pickled by dipping. He said that for that pickling to be effective the small bubbles that were noticed on many of the grains had to be broken.

GREEN PATCH (Average annual rainfall, 26.56in.).

April 29th.—Present: 11 members and one visitor.

HOMESTEAD MEETING.—The monthly meeting of the Branch was held at Mr. E. E. Chapman's residence, and the evening was devoted to the discussion of various questions of local interest. The Chairman took the opportunity of presenting to Mr. E. Chapman a life membership certificate of the Agricultural Bureau of South Australia. Mr. Chapman also tabled some excellent samples of rope that he had manufactured from thatching grass grown on his property. Mr. Whillas reported the loss of a number of ewes that he considered had been poisoned by eating stinkwort. In the discussion on this question that followed, the Hon. Secretary (Mr. E. L. C. Sinclair) said that he had found that a frequent change of pasture was the cheapest and best means of preventing trouble. Mr. Murray spoke on the subject of the hand-feeding of sheep. He had fed his sheep on an equal mixture of hay and cocky chaff, and the animals did very well.

KOPPIO (Average annual rainfall, 22.40in.)

April 22nd.—Present: nine members.

POISONING FOXES AND EAGLES.—A considerable discussion took place on this topic, and members gave their experiences. It was generally agreed that foxes were fairly easily poisoned with strychnine, but members found that the poison did not affect the eagles to any great extent. One member said they could be successfully poisoned if a small quantity of baking soda was added to the strychnine used.—A good discussion followed on the subject of sheepdog trials, and it was decided to call a meeting at Cummins on Saturday, June 22nd, for the purpose of forming a committee and to discuss preliminary arrangements for the holding of a trial.

O'LOUGHLIN.

April 24th.—Present: seven members:

STARTING A SCRUB FARM.—Under this heading a paper was contributed by Mr. C. Bergman. First of all, he said, one should select the site for the homestead and surrounding buildings. They should be erected on the highest ground, and, if possible, in the centre of the holding. The next item of importance was the sinking of tanks for water conservation. If the first tank was made near the homestead, a considerable amount of time would be saved in the watering of the stock. It was a mistake to put the tank in a hollow portion of ground, because when there was a surplus of water it would lay around the tank, and possibly cause it to burst. The timber in that district was much too heavy to be rolled down, and when cutting the trees one should make a point of felling them level with the ground. During the first year one should endeavor to clear 200 acres, and 100 acres each succeeding year. He was not in favor of the continuous cropping of land, and thought that it should only be worked three or four years in succession. For the first working of the scrub block he advocated the use of the disc plough, not only because of the shoots and rubbish, but also because on a scrub block the stubble land had to be put in for the first few years, and the disc implement made a better job than the share plough. It was better to start in a small way than to purchase a number of implements that one could do without, until the farm was properly established. The Hon. Secretary (Mr. E. O. Dahl), in discussing the paper, said it was a mistake to put the tanks near the stables, because in the event of heavy rains much of the refuse from the outbuildings would be washed into the water. Members agreed with the writer that it was best to crop the land four years in succession, but the majority of men starting a scrub block found that that was almost impossible, because they had their hands full in trying to deal with the shoots, stumps, rabbits, and the host of other things that must be done on the new land, so that it was found necessary to crop the land five and even eight times without giving it a spell. With the help of artificial manures and good stubble burns they considered the land would not be affected to any great extent.

SALT CREEK.

April 20th.—Present: 13 members and eight visitors.

DEALING WITH SHOOTS.—The Chairman (Mr. C. Venning) in a paper on the above question, said one of the worst troubles of the settler in new districts was the growth of shoots. Scrub that had been burnt before being rolled seemed to be the worst. It was a great mistake, he considered, to log down more scrub than could be handled. Land that carried a large crop of shoots in the first year should be well ploughed and sown with wheat at the rate of about 30lbs. of seed and 40lbs. of super., and then well harrowed. Oats would do well on light soil, and would carry the fire better than the wheat straw. If the stubble was too thin to burn a fire rake should be secured, and a suitable day selected. If the rake was correctly handled most of the shoots would be destroyed. If it was found that the land was very dirty it should be thoroughly worked with the harrows. Some people were of the opinion that a heavy plough lifted too many stumps, but when they were once pulled out and destroyed the land would be all the better for it. He felt confident that if the land was treated in that manner for three or four seasons the shoots would soon be destroyed.

KOONIBBA, April 25th.—The evening was devoted to the discussion of the large number of cases of sickness in horses at present in evidence.

PENONG, April 27th.—A general discussion took place on the best means of improving the meetings of the Bureau. Messrs. Place, Shillabeer, Stiggants, Murphy, and Grad emphasized the following points:—The necessity for all members to attend meetings at the advertised hour; members taking part in the discussion; and the advisability of conducting experiments with various wheats and quantities of manures.

YEELANNA, March 20th.—The Hon. Secretary (Mr. G. C. Smith) read an extract from a weekly paper.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

BERRI.

April 24th.—Present: 23 members.

The question of "Irrigation by Cement Pipes" was initiated by the Hon. Secretary (Mr. W. R. Lewis). Quite a number of members had installed that system, but difficulty was experienced with the outlet pipe. Mr. Tamlin produced an outlet pipe that was very effective, but members considered the present cost of the pipe very expensive.

BORRIKA.

April 27th.—Present: 22 members and one visitor.

SHEEP ON THE MALLEE FARM.—Mr. E. L. Cowled contributed a paper. In dealing with the question of sheep, he had in mind, he said, that district in particular, where very little natural grass grew in the scrub before the land was cleared, and where practically none of the farms were fenced for sheep. Even should wire be obtainable at a reasonable price, he doubted whether it would pay to fence the paddocks until all the mallee shoots were killed, so that the only alternative would be to hand feed the sheep. By way of suggestion, he outlined the following plan:—A small paddock, say, 5 acres, should be fenced off close to the homestead, and one that was close to the windmill, in order that a good supply of water could be easily laid on. If possible, one should endeavor to have the small paddock adjoining the larger ones, because the sheep could then be turned out into the fallow and return to the small paddock at night. In that district, in common with most of the mallee areas, where the soil was of a light nature, they were faced with two factors, which, if not reckoned with at once, would develop into very serious problems. Firstly, if the new land was cropped for three years, and then left out, the growth of shoots and bushes made the land far more difficult to clear than when it was new. The only way that was left for farmers to cope with that difficulty was to crop every year and then fallow the land. Secondly, if more than two crops of wheat were grown in succession, take-all made its appearance; and if another crop of wheat was sown, it was generally too poor to carry a fire. The only way out of that difficulty was to sow oats after the first crop. That had the double advantage of generally allowing one to secure a good stubble burn, and also to act as a check against the development of the take-all. If every farmer grew so many oats, the question arose of what he was to do with them. They could be hand fed to the sheep. If 200 acres of oats were sown, as much as possible should be cut for hay, and the other reaped and fed to the sheep with the chaff. Cocky chaff could also be added. It was advisable that the land on which the crop was grown for hay each year should be changed, in order that each portion would receive a stubble burn. On the basis of $\frac{1}{2}$ ton of hay per sheep each year, 25 tons of hay would be required to feed 100 sheep. It would also pay to grow small crops of peas, rape, &c. The capital to start on that plan would not be very large, for if one commenced with 25 ewes and a ram, the flock would increase as fast as the farmer could make room for them.

CLAYPAN BORE.

April 22nd.—Present: five members and seven visitors.

FARMING IN MALLEE COUNTRY.—“To obtain good results from mallee country,” said Mr. Robinson, in a paper on “How to Make Farming Pay in Mallee Country,” one should keep livestock in addition to growing wheat. To secure good crops it was important that one should have good fallow, and if sheep were kept they would considerably improve the land. But it should not be overlooked that to run sheep successfully good fences and small paddocks should be erected, and provision made for a plentiful supply of water. As a subject for illustration he took a farm comprising 1,000 acres. That would allow for 300 acres under crop, 300 acres fallow, and 300 acres pasture land. That would leave 100 acres; of that area 10 acres could be allotted for the homestead and surrounding buildings. Of the remaining area, 60 acres could be sown for hay and 30 acres for such green fodder crops as barley and oats. He considered that every farmer should keep a few head of cattle, pigs, and poultry. A farm of 1,000 acres should be easily worked with 12 horses, but they should be well fed and cared for. 60lbs. of good clean seed wheat, with 80lbs. to 100lbs. of super., would, as a rule, be found sufficient quantities for that district. For a hay crop he suggested 50lbs. of oats and 100lbs. of super. to the acre. During the slack season on the farm the time should be devoted to the overhauling of the machinery. In conclusion he pointed out that if possible a garden should be laid out around the homestead.

HALIDON.

May 1st.—Present: nine members and three visitors.

AIDS TO SUCCESS ON THE FARM.—Mr. J. M. Braithwaite, in choosing this as the title for his paper, said he had taken as an example the man of moderate means rather than the one who had unlimited funds at his disposal. He should, first of all, carefully plan out the land in order to arrange the homestead to the best advantage for the working of his paddocks, as a great deal of time could be saved at meal times, and the watering of stock would be made much easier. The farmer who had to depend to a great extent on his own labor, with possibly a son to do the odd jobs about the homestead, should not sow more than, say, 200 to 250 acres each year, for to put in more than that would mean that the work would not be done thoroughly, and he would not get the best results at harvest time. He considered three years was the limit in that district for cropping before the land was left out for fallow. In the meantime new land could be made ready for cropping when the other was out for a rest. Time would be well spent if it was devoted to keeping the fallow clear of weeds, shoots, &c. He classed the harrows as a most important and necessary implement, and considered that every farmer should have a set of them. The disc implements were not able to do the work that the share plough did in pulling out the stumps and spinifex, but they could be used to advantage on certain classes of soil. He strongly advised the use of the share implements, they lasted considerably longer than the disc, and were not nearly so expensive to keep in repair. He spoke very strongly against the buying of machines that one was not able to pay cash for. When cutting hay it was advisable to cut a little more than was actually required for stock feeding. If that was done, and the cocky chaff saved, one would soon accumulate a stock of fodder that would be most valuable during a dry season. Living and labor expenses were very high, and the returns from their wheat was not all that they desired, yet he felt sure that by carefully grading and selecting those classes of wheat best suited to their district, and by thoroughly working the land, they would be able to make their incomes meet the expenditure. Side lines such as cows, pigs, and poultry, could be made to help reduce the cost of running the farm. Fruit and vegetables were not always procurable, and he thought every farmer should start a garden. The following points should be carefully studied by every farmer in the mallee:—Work the land well, and do not over crop it nor over estimate the returns, buy only those things absolutely necessary, and watch the expenses for any leakages.

LAMEROO (Average annual rainfall, 16.55in.).

April 27th.—Present: 13 members.

CULTIVATION OF STUBBLE LAND.—Mr. E. J. Troubridge read a paper dealing with the above question. He was glad to notice that a number of farmers were burning the stubble and drilling or broadcasting oats upon the land. He considered that a very easy and inexpensive opportunity of improving the land and at the same

time securing an abundance of good green feed. He suggested the burning off of all the wheat stubbles and drilling or broadcasting oats upon them with a view either of cutting the crop for hay or grazing for livestock. He preferred the latter plan. The paddocks that were intended for grazing could safely be put in during March and thereby obtain the benefit of the early rains. Some people might question the advisability of sowing the oats so early, because they might not germinate too well. For several years past he had made a practice of drilling in the oats without any other working on the land intended for grazing during that month, and had found the result very satisfactory. It should be the aim of every farmer to have small paddocks of cultivated feed carrying many head of fat stock rather than large stubble paddocks with a few head of stock in them. He had also tried Cape barley. It grew quickly, but did not last so late in the year, and the stock did not seem to care so much for it as oats or wheat as a green fodder. He was convinced that by the practice of cultivating the stubble lands for fodder crops the carrying capacity of the farm would be increased. In opening the discussion on the paper Mr. J. A. Koch was entirely in accordance with the views of the writer, and thought that the fallowing of the stubble land for oats the following season would show good returns. Mr. Cowley said the paper had struck the keynote of successful farming in the Lameroo district. Oats should be grown on a large scale, but the farmer should also go in for livestock. Mr. E. T. Wray said he was not sure that all the stubble should be burnt, as it destroyed a good deal of feed. He considered some of the stubble should be left for the stock to pick over. It was not wise to sow stubble land for a crop, as there was generally self-sown wheat amongst it, and he thought oats should be grown on grass land.

MERIBAH.

April 24th.—Present: 10 members.

HORSES.—A paper on this subject was read by Mr. W. T. Young. He was of the opinion that the medium draught was the class of horse most suitable for the use of the farmer. It was only natural that if one wished the horses to work well and keep in good health and condition that they should be well fed and stabled. If one wished to keep the horses free of sore shoulders, well-fitting collars should be worked on them. He thought the collar lined with horsehair preferable to the one lined with straw. He did not think the horses would come to any harm if allowed to drink when work was finished. Mr. Munday, in discussing the paper, said the leather-lined collar was less liable to give a horse sore shoulders than the flannel-lined collar. Mr. Nitschke suggested padding the collar both above and below on those horses that were affected with sores on the shoulder. Mr. F. C. Tee also agreed with the writer that for that district the stable should be built facing the east. Situated in that position the morning sun would be able to enter, and provided the stables were kept clean, much of the sickness of the horses would be obviated.

MONARTO SOUTH, April 27th (Average annual rainfall, 14in. to 15in.).

April 27th.—Present: 14 members and three visitors.

HOW TO MAKE FARM LIFE ATTRACTIVE.—In a paper on this question Mr. B. Schenscher said as a rule most farmers did not have the time to look after a garden, but once started he felt sure some member of the family would take an interest in it. A few fruit trees should also be planted. The horses should be one of the farm's best attractions. If well cared for sheep would prove to be a good investment, as one of the sidelines of the farm. For the convenience of the women folk a light conveyance should be provided. In addition to the manual work connected with the working of the land he considered every farmer should be a member of the Agricultural Bureau and take a lively interest in its working. The many useful subjects that were discussed at the meeting would assist him in the successful working of his farm.

MURRAY BRIDGE.

January 29th.—Present: 20 members and visitors.

ORCHARD IRRIGATION.—Mr. J. H. Darwent (Government Fruit Inspector) delivered a lecture on "Orchard Irrigation." "A sufficient amount of moisture in

soil is necessary," he said, "to provide for its fertility, and we must add to or reduce the quantity as demanded by the trees. An over-abundance is a bar to fertility, impairing the aeration of the soil, and tends to increase the amount of salt in the land, and must be counteracted by drainage. But it seldom occurs that soils in districts which receive a heavy rainfall contain, all the year round, sufficient moisture for the best results from the crop. In other words, irrigation in many of these districts would be beneficial at certain periods, though payable crops may be produced without it. But it is in the arid and semi-arid parts of our State that the application of water to the soil is absolutely essential to the successful cultivation of the land. Thus we see that some portions of the State can be successfully occupied without irrigation, while others cannot. It is the latter with which we are concerned this evening, and I propose dealing with irrigation on the land contiguous to the Murray used for the cultivation of fruit. The moisture necessary for the existence of plants is nearly all taken from the soil. A small amount is absorbed by the foliage through the pores. Unless sufficient moisture is in the soil the mineral salts will not be dissolved, and consequently the plant lacks nutriment, as plant food can only be taken up by it in solution. Also the available water is not enough to allow for the transpiration which takes place in hot weather. On the other hand, excessive irrigation prevents the proper aeration of the soil, to the detriment of the plant and the exclusion of bacterial life. This may be corrected by drainage, or the withholding of the water, and the addition of humus to the soil. To obtain the best results it is essential that we should apply the minimum amount of water necessary for the plant's requirements, and provide for its conservation in the soil. To ascertain when water is required we must not wait until the plants show signs of wilting, but continually test the soil, and thorough cultivation must follow each application of water if we wish to prevent it from evaporating. Water is necessary to dissolve minerals in the soil, and place them in a condition in which they are available as plant food, and to keep plants in a turgid condition, so that their different parts may be able to carry out their functions. For instance, the main function of the leaf is to act as a laboratory for the manufacture of organic food from the carbon dioxide of the air, and from the water absorbed from the roots. Knowing the result of withholding water from a plant in need of it it is evident that its leaves will be unable to perform the function mentioned above. To show the necessity for keeping a sufficiency of moisture in the soil, I may say that it has been shown by experiments that it requires from 300lbs. to 350lbs. of water to produce a pound of dry matter in plants. The transpiration is so great that we must keep a sufficient supply in the soil to meet this need. The water-holding capacity of soils differs greatly, sandy land being the least retentive, while the finer grained clay soils have the power of retaining most moisture. In the case of the former, much can be done to improve this deficiency by ploughing under cover crops, thus adding humus, improving the texture, and increasing the fertility. If leguminous crops are used for this purpose, we provide food for the nitrogen-producing bacteria so valuable to growing trees. By water-holding capacity of the soil, I refer to the water held in suspension between the soil particles, known as capillary moisture. This water passes through the soil up or down, or laterally, and as it is this source from which plants derive their supply, it is important that every means should be taken to conserve it in the soil. If you pull a small plant from loose, moist soil you will find that the earth clings to the roots. If shaken gently in water, and the earth washed off, you will see that large numbers of root hairs are placed all over portions of the roots. The root hairs find their way between the soil particles, each of which is surrounded by a film of moisture, which they absorb together with the mineral salts in solution. Thus we see that plants require a sufficient quantity of moisture, and that we must provide for its conservation. Stone fruits and vines may receive applications of water at any time when the soil conditions demand it, after the setting of the fruit, and up till the time when the fruit has reached maturity, and only needs to ripen. After harvesting the crop, an irrigation may be given if necessary to fill the buds for the next season's bearing. In drought years a good soaking in winter before vegetation activity begins may be given. In regard to citrus trees—they should be watered before blooming and after the fruit is set. After that it is necessary to see that the soil is kept moist until the crop has matured, avoiding an excessive amount of moisture, especially during the cold period of the year. Different methods of applying water are used:—(1) Ring

System—This consists of making a ring just outside the spread of foliage, and filling it with water once or more if necessary. (2) Check System—Surround small blocks of trees with low banks, and fill the basin until the soil is well soaked. Care should be taken that the soil is heaped round the trees to prevent the water coming into contact with the stems, otherwise damage will result. This method floods the land too much to be recommended. (3) Furrow System—Make furrows between the trees, and run the water slowly down between them until the ground is sufficiently soaked. Make the furrows deep, so that the water is placed down to the roots, instead of the roots coming up to the moisture. Young trees only require a furrow on each side of the row, but as the trees become older, and the ground between them is occupied by the roots, it is necessary to gradually increase the number of furrows, so that the whole of the land may be soaked. Assuming that the water has been applied to the land, we are now concerned with the after-treatment. Few who are just starting an orchard recognise the great importance of thorough working of the land after the water has been applied. If this precaution is neglected, then we quickly lose the moisture which we have placed in the soil. A day or two after the watering, when the soil has lost its stickiness, it should be thoroughly stirred with a cultivator to break the capillary connection between the surface and the moist layers below, and leave the surface with a deep, fine soil mulch. Another method of conserving moisture used where the water supply is limited is the growing of cover crops, such as the hairy or black vetch between the trees, and allowing it to dry and settle down on the land. Though a little more water may be used in spring, the shading of the land provided by the thick mulch lessens the quantity necessary during the hottest months of the year. Of course, a strip of cultivated land on either side of the young trees must be provided to allow of the irrigation furrows being made. The ploughing under of the dry crop after it has done its duty will improve the texture and water-holding capacity of the land. A heavy straw mulch will protect the soil from the sun's rays, but it must be removed at each irrigation, and also prevents light rains from reaching the soil. Thorough cultivation to break the capillary connection between the surface and the moist subsoil will probably be found to be the most practicable method for conserving moisture. Excessive irrigation is as much to be guarded against as not giving enough water to trees. It will cause seepage, and the accumulation of salt at the lower parts of the orchard. Also the application of water during the blooming period will militate against a good setting of fruit. Good irrigations at intervals of about six weeks placed well down in the soil, and proper after-treatment, are far better than twice the number of irrigations, using half as much water each time. The latter would entail the making of furrows for each irrigation, and the subsequent breaking up of the soil. Of course, if one were growing crops between the trees it might be to the advantage of those crops to have more frequent waterings. In that case it would be necessary to provide a storage tank at the top of the orchard. Seepage will probably be troublesome on some of the blocks on the Lower Murray Settlements, and the bad effect of it will be intensified at that part of the orchards where the sandy loam meets a hard, impervious soil under which hard pan is found. This soil is found at the lowest part of nearly all the blocks, and it will be necessary to provide drainage to take the water away, or damage is sure to result from the accumulation of salt. Unless this precaution is taken, the result will be an extension each year of the area affected. Water from a river like the Murray contains a certain amount of salt, though it is good for irrigation. Seeing that all water used over the requirements of plants increases seepage, which sooner or later means salt, it is patent that excessive irrigation should be avoided. Putting water on the land will not alone give satisfactory results. It is only by giving the fullest attention to cultivation and drainage in conjunction with irrigation that we may hope to successfully occupy orchard lands on these river settlements." In replying to questions Mr. Darwent said that no definite rule could be laid down for the amount of water needed, as the soils varied so greatly. Where the subsoil was sandy or limestone much more was needed, as it was so porous. The lecturer emphasized the danger of irrigation when the fruit was setting, as there was a likelihood of causing the fruit to fall. After watering the orchard, a crust settled on top of the soil, and it was beneficial to harrow between the waterings. On heavy soils the use of lime and gypsum might be used with great advantage as a corrective of sour conditions. Deep cultivation was advocated as inducing the moisture to be at a greater depth.

Where the cultivation was very shallow the moisture tended to be near the surface, and the roots followed it up, and were liable to suffer during dry periods. Shattering the soil by means of explosives was recommended as assisting the roots to penetrate in a way they did not do when a basin-like hole was dug for them. At a meeting held on February 26th the Superintendent of Technical Education (Dr. Fenner) gave an illustrated address on the question of "The Relation of Technical Education to Country Conditions." The lecturer showed the need of technical training and how it was being appreciated in other countries. He then went on to show how we lacked any education for the great mass of young people after they reached the age of 14 years. At the most impressionable age they left school, mostly quite untrained to enter on any undertaking requiring skill; the result in many cases being that they added to the large ranks of the unskilled workmen. Fine pictures were shown of the work being done in towns and rural centres in those parts of the world where technical training was being undertaken. To provide a scheme of training for large centres of population was a fairly large task, but the problem was how to reach effectively the scattered population of a rural district. That particular branch of education would largely depend on the industries of the district, i.e., in such a place as Port Pirie the training would be largely along the lines of metallurgy and chemistry, but in a farming centre the technical training would be on an agricultural basis. Mr. Parish, M.P., in moving a vote of thanks to the lecturer expressed his keen appreciation of the fine address, and stated that he would use his best efforts to support any movement for a technical school in this district. Mr. F. W. Lehmann seconded the vote.—At a further meeting of the Branch, held on March 26th, the Botanical Assistant and Quarantine Officer for Plants (Mr. H. W. Andrew) delivered an address on "Weeds and Seed Control." Much interest was evinced in the mounted specimens which the lecturer had prepared.

NETHERTON.

April 19th.—Present: eight members.

THE HORSE.—The selection of the horse for beginners in new country, said Mr. Lower in a paper on "The Horse," was a point that should be well considered. It was a mistake to buy old and worn-out horses simply because they could be purchased for a smaller amount. Horses between the ages of three and six years should be purchased, if possible, of the draught type; if not, those of a lighter breed would serve equally as well. If one intended to breed, then of course even more judgment should be exercised when purchasing. A mistake very often made was in the selection of the sire. Some were inclined to use the sire that could be obtained for a cheap service fee rather than pay extra and secure the services of a thoroughly reliable horse. To get the best results from the horses they should have a warm and well ventilated stable, and also, when working an implement, it was a much better plan to work an additional horse rather than to see the team taxed to its full strength. More work would be done if the horses were not worked for long hours. They should be allowed at least one day of rest during the week. Mr. R. Byerlee also contributed a short paper on "Sidelines on the Farm." He pointed out that there were other interests besides wheat-growing which should receive the attention of the farmer who wished to increase the production of his farm. Sheep, cows, pigs, poultry, and the breeding of a few horses were items that should not be overlooked. He thought that wheat and hay grown on the farm would return greater profits if fed to the stock than it would if sold at present market values.

PARRAKIE (Average annual rainfall, 16in. to 17in.).

April 27th.—Present: eight members and two visitors.

PICKLING WHEAT.—Members discussed the various methods employed for the pickling of wheat. Mr. A. J. Beelitz used formalin, and he had found it very successful. The Hon. Secretary (Mr. O. Heinzl) pickled his seed wheat on a boarded floor. He used 4oz. of bluestone to a gallon of water, and poured the liquid over the wheat, and then turned the grain backwards and forwards with a shovel. He had always found that plan most effective. The chairman pickled his seed by dipping the bag in the solution, but it had not been at all successful.

RAMCO.

March 22nd.—Present: nine members.

DRYING STONE FRUITS.—The following paper was contributed by the Hon. Secretary (Mr. J. J. Odgers):—‘The drying of stone fruits consists in the evaporation by heat of the moisture contained in the fruit, and this evaporation is effected by artificial heat or by the heat of the sun. By this evaporation so little moisture is left in the fruit that the bacteria which cause decomposition are not able to work, and so the fruit can be kept for months. But there is drying of fruit and curing of fruit. The former is easy, for it simply means leaving the fruit so long on the trays that it becomes like chips; but to properly cure the fruit needs care and experience, for when finished the fruit needs to be soft and leathery, pliable to the touch, and not the least ‘chippy.’

Method of Drying.—Where the summer heat is not sufficient, then some form of evaporator or drying kiln must be used. There are many of these on the market, and no doubt a good sample can be turned out. I have had no personal experience with them, but from what I can gather I do not think the sample equals the sun-dried product. They need a fair amount of attention, and so far as the Murray is concerned, I do not think we can better the sun drying of our fruit, and I would advocate evaporating only in exceptional seasons.

Outfit.—First we need trays on which to put the fruit. There are many sizes—3ft. x 2ft., 5ft. x 2ft., 4ft. x 3ft., and 6ft. x 3ft.—growers using various sizes according to the size of their sulphur box or other individual needs. All the trays are made by nailing boards of the required length to a 2in. cleat. Personally I favor the 3ft. x 2ft. tray as a ‘general utility’ tray. This tray is especially suited to a man who has to employ little or no labor in the drying season, for one man can easily handle it; it is not too heavy for a woman, and two children can also manage it without difficulty, so that for a man and his family the small tray is admirably suited. For large orchards, where labor is employed, of course larger trays are more economical—a 6ft. x 3ft. is not too heavy for two men. I use a 1in. x ½in. strip along the sides of my trays. This prevents the fruit from falling off, and the trays are handled more quickly.

Sulphur Boxes.—Then you need a box, nearly air-tight, to place over the trays of fruit whilst the sulphur is burning. This can be made by covering a framework of any light wood with calico or hessian stretched tightly, tacked on and then covered with lime wash, or it can be covered with ruberoid. Personally I use a galvanized iron box made from five sheets of 6ft. x 3ft. plain galvanized iron, 26 gauge. Take two sheets lengthways, and turn down a 4in. strip at right angles and rivet both to a third sheet. Then cut the other two sheets each 4ft. 2in. long, turn down 4in. on sides and top, and rivet to the rest, and you have a handy box 6ft. 6in. x 3ft. 6in. x 2ft. 8in. Solder the joints, and nail a narrow strip of wood 9ft. long on each side about a foot from the bottom for handles, and you have a strong but light box. It needs painting inside to prevent the sulphur eating the iron, and I have found lime or cold water paint as good as any. Of course with the present price of iron such a box is expensive, and although I have had no experience with beaver board, I think one made from that material would prove good. If you have a large quantity of fruit to handle then a sulphur house is economical. I would only advocate a house provided you had a truck on which to put the trays and wheel in and out of the house, otherwise the fumes of the sulphur are a drawback.

Drying Ground.—Handy to the cutting shed you need a drying ground, and a good lucerne plot makes an ideal one, as it keeps the fruit from the dust, which is one of the biggest bugbears in drying. It has a disadvantage in being cooler than bare ground, and also the fumes of the sulphur, I think, affect the lucerne in time. To a certain extent I believe I have overcome this by placing the trays on 2in. x 2in. timber, and thus raising them from the lucerne. A tramline running from your sulphur house through the drying green is a great saving in labor.

Apriots.—I believe in picking these the day previous to cutting—they cool down during the night, and are handled quicker by the cutters. The fruit should be ripe, but not too soft. It should be cut clean around so as not to leave a ragged edge, which spoils the look when dried. Place the cut fruit on the trays cut up, and see that they are even, so that you do not lose juice in sulphuring. Do not expose cut fruit to the hot sun before sulphuring. Place the sulphur box over the trays and put about 1lb. sulphur to 50 cub. ft. of space. I put the sulphur in long narrow tins with a little dry grass at each end, and have no difficulty in getting the sulphur to burn. Leave the sulphur box on at least five hours, and if you find

the cups of the fruit full of juice and the fruit semi-transparent you can feel satisfied that the sulphur has taken. During the heat of the day you will find that it does not need so much sulphur, and in fact, with a house I think it pays to raise the temperature before lighting the sulphur. After sulphuring put the trays out on the drying ground, and with good weather and plenty of trays I would stack after one and a half days, and finish off in the stacks—by this means getting thicker and heavier fruit. Do not stint the sulphur, for it is the sulphur that fixes the color, and the public buy on 'color'. When dry tip the fruit into the sweat boxes and let it there for at least a fortnight to sweat up. Whole Apricots.—Drying apricots whole is a means of handling a lot of fruit in quick time, but I am not a lover of this method. You need plenty of trays, and must give the fruit double sulphur, in fact with whole fruit more than any kind I think 'plenty of sulphur' is the secret of success. To my mind, however, what you may save in cutting and in time, you lose after the fruit leaves the orchard in grading, freight, and charges on a ton of stones in every four tons you handle, plus, at present, a slower sale. Nectarines.—These are handled as apricots, except that with Stanwicks I increase the quantity of sulphur. Goldmines, I think, make a good whole dried sample. Peaches.—These again are dealt with as apricots, except that I give them an increased quantity of sulphur, and they take longer to dry. I stack them the third day, and finish off in the stacks. Prunes.—This is a fruit that I think will in time become prominent along the Murray Valley. A large quantity is consumed by the public, and at present we import a large quantity each year. I have tried, and am trying different varieties, and am satisfied that the standard Prune D'Agen, or French prune, will do in our district. To dry you can dip them in a boiling lye of 1 in 10 to crack the skins, or run them down a shoot with a number of pins standing point up about $\frac{1}{2}$ in, to prick them, and then on to trays to dry. Before packing dip into boiling water to wash the fruit, and then into a syrup, and spread out on the trays for a short time to dry. The Fellemburg prune is also a good variety, but I do not much fancy Prune Splendor for our river soil.'

THE DRYING OF GRAPE FRUITS.—The first work in connection with the harvesting of grape fruits, said Mr. H. Green, in a paper dealing with the above question, was the picking of the fruit. In order that a good sample might be secured the fruit should be picked free of leaves and stems. Not only would the fruit dry more quickly, but the color of the finished product would be much better. The next item was the dip. In large orchards a dip holding about 100 galls. was used, well built in with bricks and a flue running around both sides, the chimney being at the end, with a stoked fire. The strength of the dip depended upon the variety of fruit and the weather. The best plan to be adopted when dipping the fruit was to bring the water to boiling point, then select an average bunch of the variety that was to be dipped, and put sufficient caustic soda into the dip, so that when the grapes were immersed they would show one or two small cracks. In dealing with sultanas one should be very careful, because the fruit was so delicate, and if the solution was made too strong a number of berries would fall when the bunches were being packed. The strength of the dip required for that particular variety should range from between 20 to 80 parts water and 1 part soda. The fruit should then be immediately threaded on the racks, or, instead of cooling off as it should do, it would become steamed, thereby causing the sugar in the fruit to run, and making it harder to rub off the racks. The sultanas should not be spread too thickly on the racks, or they would not dry well, neither would the color be so good. No attempt should be made to rub the fruit off until thoroughly dry. They should rub off the top ties first, and allow the sun to act on the next row. That plan should be followed until the job was completed. When the fruit was ready for boxing, if possible it should be left until late in the afternoon, when the heat of the day was over, and there would be no fear of the fruit heating in the boxes. The plan of rubbing the fruit off before it was properly dry was one that should be avoided, because the fruit in that state was sticky, and a certain amount of rubbish would be bound to adhere to it. If rain fell and the fruit on the racks became wet no great harm would have been done, because the fruit would soon dry again in the wind. Lexias required a much stronger dip than the sultanas, a solution of 8 parts water to 1 part soda would be found sufficient. Owing to currants not ripening at once he had found that if one wished to secure a good color the fruit should be picked over once or twice, and covered over to exclude as much light as possible from them. If the fruit was found to be a little sticky after being picked, the sun

should be allowed to play on it for a day or so. The main item in connection with the drying of the fruit was the rubbing off and the boxing. On no account should fruit, if at all wet, be put into the boxes. It was a mistake to think that by packing the fruit in a damp condition a few extra pounds in weight would be secured. Wet fruit threatened the keeping quality of the produce, and would in all probability be classed in a lower grade. The better and cleaner the fruit could be placed on the market the better it would be for the individual grower and for the whole trade. Only by strict attention to cleanliness, coupled with thoroughness and sound common sense, would the best article be produced.

RAMCO.

April 29th.—Present: 12 members.

REGULATING OUTLETS DURING IRRIGATION.—Mr. W. H. Morgan, in introducing a discussion on this question, said the usual method of letting water out of an irrigation channel into furrows, was by using a 2in. galvanized pipe, about 2ft. long, with a shutter at the end in the channel. He had found many disadvantages with that. There was a danger also of vibration closing the shutter, or of its being washed away altogether, whilst weeds and rubbish also choked the outlet and had to be constantly cleared. He thought he had overcome those objections by using an outlet which he exhibited. That was an ordinary vent, but on the outside, a short distance from the end, he had made a saw cut about halfway through the pipe, and in that another shutter had been inserted that was cut from a piece of tin the shape of the pipe. With that outlet he took off all the shutters in the channel before commencing, and regulated the shutter outside. The pressure of water kept it in place, and there was no need to place the hands in the water. If the pipe choked one just lifted the tin and the water cleared the outlet. After the irrigation he replaced the shutters in the channel, and the outlet was closed both ends, preventing sand, lizards, &c., from choking it between irrigations. Mr. Boehm considered that if the end of the pipe was put in concrete it would protect it from the horses when turning at the end of rows. Mr. F. Lewis initiated a discussion by asking the following question, "Does it pay to plant the high lands, say, 10 acres, for hay?" He considered that it did not. By the time one cleared the land, paid for hire of plough and drill, bought seed and manure, and then, just when apricots were coming on nicely, one had to hurry on with the hay and pay for cutting and carting. He thought the return would not sufficiently recompense one, and it was better to buy the hay that was needed. Mr. F. G. Rogers considered it was cheaper to buy chaff. First it did not pay to keep the horses, plough, drill, etc., and then the return was not sufficient to warrant the hire of a team. Last year he put in 30 acres on halves. The crop was not good enough for hay, and was stripped for wheat. His share was £8, which did not pay him. Mr. Hartwig thought it paid provided one used fallow land, and then put it in the next year. He gave an estimated cost for 10 acres, as follows:—Fallow, 6s. per acre, £3; cultivating twice, 2s. per acre, £2; drill, 2s. 6d. per acre, £1 5s.; seed, 1 bush, 3s., £1 10s.; manure 3s., £1 10s.; binder 7s. 6d., £3 15s.; average $\frac{1}{2}$ ton, carting, £1 10s., £3; total cost, £16. Average return, total $7\frac{1}{2}$ tons at £2 10s. per ton, was £18 15s., giving a profit of £2 15s. Other members considered that taking loss of feed for 12 months it would not pay. Mr. Kotz thought it would pay provided one had sufficient horses, and used orchard implements, broadcast the wheat and the manure, and cultivated it in. Mr. F. Hartwig advised putting in wheat with the cultivator.

WAIKERIE (Average annual rainfall, 8.89in.).

April 19th.—Present: 13 members.

ORCHARD AND VINEYARD PESTS.—Mr. W. Francis gave an interesting paper on this question. He dealt extensively with the various insects, grubs, &c., which, if left without treatment, work serious damage to young vines and trees. He also stated it was necessary for growers to spray regularly for the various scales and fungi to which most trees were subject.

WYNARKA.

April 27th.—Present: seven members and one visitor.

SUBTERRANEAN TREFOIL.—Mr. Colton, who contributed a paper dealing with this subject, said:—"This fodder plant is so named on account of the peculiar manner in which the pods and stalks, soon after the fertilization of the flowers has taken

place, rest the crowns of the flower heads upon the ground, after which they ripen and penetrate the soil. In the case of hard surfaces the seed has difficulty in penetrating, but wherever the plant grows some pods will be found buried. This peculiarity of burying its pods is the chief recommendation of the plant. If it were not done, so fond are livestock of every part of it, that carrying the seed above the ground, it would, unless protected like grain crops, be quickly exterminated. Although this crop is merely an annual one the heaviest stocking makes no difference to the succeeding season's crop, as each autumn the buried seeds, after the first good rain, will germinate. The trefoil is valuable as a permanent pasture plant. Previous to the introduction of the trefoil it was difficult in the best seasons to keep the cattle in good condition, but since its advent it takes but little time to fatten them. Considering the expense attached to its production and its value as food for any kind of stock, whether green or dry, it stands in advance of anything else that can be grown on soils of any quality. It succeeds well where lucern, paspalum, or maize would refuse to grow; and when once sown, whether on land occasionally cultivated or on permanent grass pastures, there it will remain for all time without resowing. It is gradually creeping up our barren hillsides, and horses and cattle all through the summer eat the dry stems and unburied pods, where previously they would have died from starvation. This trefoil, as with others of the legume family, absorbs nitrogen from the atmosphere and stores it in nodules upon the roots; thus, instead of exhausting the soil, it enriches it. Experience has shown that if a luxuriant growth is desired a little super. drilled on the surface every few years will secure it. No matter how poor the soil the subterranean clover will grow. After a fire has passed over the land a heavy crop of new plants appears." Mr. Pitt reported on the experimental plot conducted by him for the purpose of determining the productive value of different varieties of wheat. The results were as follows:—Dart's Imperial, 12bush. 38lbs.; Marshall's No. 3, 13bush. 27lbs.; Zealand Blue, 14bush. 52lbs.; Silver King, 15bush. 25lbs.; Belgian Surprise, 16bush. 11b. In each case 45lbs. of seed and 80lbs. of seed were sown.

CLANFIELD, April 27th.—The evening took the form of a discussion on the questions of the "Destruction of Rabbits," "The Analysis of Super.," and "The Wheat Pool."

MYPOLONGA, April 24th.—The Superintendent of Experimental Works (Mr. W. J. Spafford) delivered an address on "Fodders for Blocks."

ROSY PINE, April 24th.—Mr. Hill read a report on the "Stability of Strychnine in Poisoned Animals," and the meeting discussed the forthcoming conference on co-operation, to be held at Lameroo.

SOUTH AND HILLS DISTRICT.

BLACKHEATH.

April 20th.—Present: 12 members and one visitor.

FODDER CROPS.—In a paper dealing with the question of "Fodder Crops" Mr. H. Pym said the raising of fodder crops depended to a large extent on the quality of the soil. Maize and mangolds were both good fodder plants, but each required rich soil and a good supply of manure. Lucerne was, in his experience, the best of all fodders to grow in that district, and on his holding he had a small plot that had been planted for 20 years, and last summer's crop was equal to any that he had ever grown. Lucerne could be fed to stock in both the green and dry stages, and the stock did well on it. He did not think it advisable to feed the lucerne off with stock, because they would do considerable harm to the plants. Oats and pease were good dry fodders. There was a good deal of work attached to the growth of a crop of pease, but he considered them well worth the trouble. A crop of pease added manure to the soil, the straw could be fed to the cattle, and the pease to the pigs and sheep. Again, the pease could be stacked without thrashing, and mice would do very little damage to them. In conclusion, he pointed out that to provide for the stock during dry seasons, fodder crops should be grown.

BLACKWOOD (Average annual rainfall, 27in. to 29in.).

April 15th.—Present: 14 members and one visitor.

GARDEN TOOLS, THEIR USE AND REPAIR.—Under this heading a paper was contributed by Mr. W. Gamble. The very high price of all agricultural tools and implements, he said, made it necessary for the gardener and orchardist to exercise economy. He considered the blacksmith shop, fitted with an anvil, forge, and vice, to be the most handy tools one could have. When ploughing was being done and the land became hard the shares could be sharpened at dinner time or after work, and no time would be lost. He recommended the use of the plough that used steel shares, because one could use the shares until they were practically worn out. Again, the harrows could be taken to the blacksmith's shop and the tines sharpened so that they would make a better job of killing the weeds and breaking up the land. The gardener should know how to take the spraying pump to pieces, and be able to fit new leather washers into it instead of having to send the machine to the city. He pointed out that before putting the pump together one should thoroughly grease all the parts, because the acids in the spray tended to make the joints very tight. It was not a very difficult matter to sharpen such tools as crowbars, picks, and forks, but to make them of a good temper required more skill. When tempering, the heat should never be allowed to go too far back on the implement, neither should it be heated above a cherry red for plunging. The tool should not be cooled off at the one dip. The different colors that showed on the tool, such as light and dark straw and purple, indicated the different temperatures. When heating a fork it should not be dipped into the water, but allowed to cool off, and the temper of the steel would be just right.

CHERRY GARDENS (Average annual rainfall, 35.03in.).

April 23rd.—Present: 13 members and four visitors.

HOMESTEAD MEETING.—The meeting of the Branch was held at the residence of Mr. C. Ricks. The members inspected the fruit and vegetable gardens. In the orange grove a fine crop of citrus fruits was observed. Mr. Ricks replied to a number of questions, and an instructive afternoon was spent.

CHERRY GARDENS (Average annual rainfall, 35.03in.).

May 23rd.—Present: 16 members and seven visitors.

SHEEP ON SMALL AREAS.—Mr. H. Strange, in a paper on this topic, said he was convinced that sheep could be kept in their district in conjunction with fruit-growing and gardening. They had so much waste produce that could easily be fed to the sheep. There were the hills on which horses and cattle did not thrive, but where sheep would find any amount of feed. The sheep could also be turned into the garden after the crop had been taken off, and not only would they eat the weeds and rubbish, but the land would also benefit from the manure of the sheep. For quiet, docile sheep he favored the pure-bred Merino, but he doubted if they would stand the cold weather. For strong, sturdy animals the Crossbreds were recommended, but one needed to have very strong fences. The Wool Instructor (Mr. H. Jackson) delivered an address in which he strongly advocated the keeping of sheep on small areas.

CYGNET RIVER.

April 25th.—Present: five members.

The evening was spent in discussing the various types of scrub-lighters. Mr. R. J. Loader had found a piece of asbestos, tied to a suitable length of wire, and dipped in kerosine, to be a very useful fire-lighter. Other members favored the use of a length of $\frac{1}{2}$ in. gas pipe, slightly bent at one end, and filled with cotton waste saturated with kerosine.

HARTLEY (Average annual rainfall, 15in. to 16in.).

January 23rd.—Present: 11 members and three visitors.

AGRICULTURE IN PALESTINE.—Lance-Corporal J. G. Hudd, of the 3rd Light Horse Regiment, a member of the Branch on active service, contributed the

following paper:—"I am not giving this paper a title. It concerns the possibilities of Palestine. A great future lies before this country. I will deal with it as I saw it first, but dates and places I cannot mention. When I first rode into it it was covered to a great extent with growing corn, the bulk of which was barley, but everywhere it was extremely thin, as only the most primitive means of cultivation are at present used—a wooden plough without a mould-board is used to break the sod. It is drawn by a camel in nearly every instance. The methods of tilling seem to be exactly the same as those employed by Abraham and Isaac and other ancient biblical characters. The corn is gathered by hand and carried in on camels and asses, the two beasts of burden in this country. Every Bedouin has his camels and asses and a few sheep. These constitute his worldly belongings. The rainfall here is everything to be desired, being about 26in. per year. There is every appearance of water being obtainable at reasonable depths, and fortunes await the introducers of modern implements of cultivation and artificial manures, &c. Colored labor is cheap and in abundance, the European markets within easy reach, in fact everything, if carried out correctly spells success and prosperity for the future. Modern engineering has opened a means of transit for produce, one of the greatest drawbacks of all. Fruit-growing has a great future. It is carried out to some extent now, but like everything the practice is very primitive. Budding, grafting, and pruning are unknown to the owners. Almonds and apricots are the main fruits; perhaps almonds are better classed as nuts, but they are all hardshelled, and many bitter. The fruit is fairly well flavored. Melons grow in abundance. Vegetables are very little grown, but I have no doubt that they could be grown tolerably well. Dairying is an occupation which could be carried on with success. As I have already stated, a fortune awaits enterprise in this country when war shackles it no longer."

HARTLEY (Average annual rainfall, 15in. to 16in.).

March 27th.—Present: nine members and one visitor.

CONSERVATION OF WATER.—"Unfortunately many farmers overlooked this very important question," said Mr. F. Clark, in a paper on the "Conservation of Water on Farms," "and waste a good deal of time carting water." Where possible, he favored a good bore or well and tank, with windmill or engine to raise the water. But on some farms the total absence of any undercurrent water, or, again, on others, the presence of only very salty water, totally unfit for the watering of stock, made that question untenable. Even that could not be accepted as an excuse for not making provision for a water supply. There were very few farms indeed on which no suitable site could be selected for the sinking of a dam. It was a great mistake to sink the dam right in the centre of a water-course. Should flood waters occur, large quantities of rubbish would almost certainly be deposited in the dam; therefore the site chosen should be somewhat away from the water course where channels could be cut to convey the water into the dam. He advised fencing in the dam and putting up a windmill and tank. By fencing it in one would be able to keep the water clear, and the stock would do much better on the water. Care should be taken when fencing to leave enough room for a dump, in view of future cleaning. Then, again, at the house some people were content with an iron tank that was usually leaking, or else one that did not hold enough water to last through a short dry spell. He gave preference to a built up tank for household use, because it saved the trouble of using a pump, that usually refused to work when required. He favored the round tanks, because they were easier and cheaper to build, and there was less danger of cracking. The paper was well discussed, some members saying that if tanks were erected alongside the implement sheds, a considerable quantity of water could be conserved.

HARTLEY (Average annual rainfall, 15in. to 16in.).

April 24th.—Present: 12 members.

STOCK-RAISING VERSUS WHEAT-GROWING.—Mr. B. Wundersitz, who contributed a paper on the above question, confined his remarks to raising stock for marketing as opposed to keeping cattle for dairying purposes. He did not think there was the

same amount of risk attached to stock-raising as there was in wheat-growing. The present prices obtainable for fat cattle and pigs were excellent, and if provision had been made for conserving fodder such as hay, ensilage, cocky chaff, &c., one should be able to keep the stock in good market condition. It was also necessary to see that a good supply of water was on hand for the stock. He was convinced that with the exercise of foresight and judgment stock-raising would give better returns than the production of wheat.

INMAN VALLEY (Average annual rainfall, 26in. to 27in.).

April 24th.—Present: 12 members and one visitor.

LAMB-BREEDING VERSUS WOOL.—The following paper on this question was contributed by Mr. E. H. Mayfield:—"Taking this district on the whole, it is better suited to wool-growing than raising fat lambs, as a breeding ewe requires the best of feed, whereas a dry sheep will grow wool and do well on second class country. Where one has a fairly large area of country, consisting of good and second class land, I should advise the keeping of a first-class line of ewes on the better land, and run the lambs on the poorer, for if bred the correct way they would turn out good woolled sheep. My opinion is that a good Crossbred ewe, mated to the best Merino ram one can afford to buy, would give most satisfactory results. A few extra pounds spent on a good ram is soon made up by the extra wool produced by the lambs. One great mistake made by so many is the selling of all good lambs and keeping the culls. Now, the latter never make good sheep or grow the same amount of wool. For rough scrub country I do not advise putting sheep younger than four tooth, and should buy the pure Merino wethers from the northern country, as they are stronger and better grown than lambs bred in this district. Allowing present market value for ewes at 30s. each, a man who can put 300 of these on his farm would have to invest £450; three rams at £10 each would make the outlay £480. A fair lambing would produce 70 per cent. (221 lambs). At present valuation store lambs are worth 15s.—£165 15s.; wool from lambs, £22 1s.; wool from ewes, £157 10s.; total, £346 6s. Ordinary losses caused by lambing, £15; expenses for hire of labor, £20; poison for foxes, 10s.; decrease in value of ewes with lambs, £75; total, £110 10s.; leaving a balance of £235 16s. profit for 12 months. In reference to the good woolled sheep, the same farm would carry 500 dry sheep. The present value of store wethers is 22s., amounting to £550 outlay. An average cut of wool (10lbs.) would bring in £375. And instead of decreasing in value, these sheep would improve in condition, and be worth a few shillings a head more in 12 months for fats, and one could safely expect a profit of 2s. per head on sale of sheep—£50—making a total of £420. As the care to be taken of these sheep would not be so strict as the ewes with lambs, and the deaths would be fewer, allowing £20 for losses, also interest on extra money invested, it leaves a profit of £400. Shearing, &c., would involve an expenditure of some pounds in each case. Yet I am confident that with the ruling market values of wool and mutton, it would pay local graziers better to pay more attention to growing good woolled sheep."

LONGWOOD (Average annual rainfall, 37in. to 38in.).

April 20th.—Present: 14 members and two visitors.

ALTERNATE CROPPING OF APPLE TREES.—The meeting of the Branch was held at the residence of Mr. R. A. Lewis, and after an inspection of the orchard and spraying and irrigation outfit had been made a paper on the above question was read by Mr. W. Tilling. He said the question of inconsistent cropping of apple trees was being debated by other countries than South Australia. It was generally noticed that a season of heavy crops would almost certainly be followed by one of great scarcity. He had read the report of some experiments carried out in relation to that question in England, and the conclusion arrived at was that the inconsistent cropping of the trees was due to climatic conditions, chiefly frost, but the conditions of that country were very different from those obtaining in South Australia. The shortage in the apple crop of the year 1917 affected the whole of this State, not only those in the frost line but those above it as well. He discounted that idea because in his orchard he had trees planted at such an altitude as to be above the frost line, and others down in a gully, yet they only gave alternate crops. There had been suggestions made that by reducing the spurs when pruning

and reducing the crop the desired effect might be obtained. In addition he recommended members to strip the whole of the crop off a tree or two and thus alter the year of cropping, and if the trees could by that means be induced to bear in a season different from the one in which they had been in the habit of bearing they might possibly bear in what was commonly termed an "off" year. He recommended the Yarra Bank as a good variety with which to experiment, as it was a very consistent tree, and though not perhaps of the finest quality, the fruit would bring good prices when there was a scarcity of apples in the market. In the discussion that followed, the Hon. Secretary (Mr. J. R. Coles) held the view that the cropping depended upon the vitality of the tree, and that it was affected by treatment and conditions. He had trees that carried heavy crops on alternate years, yet failed to make any growth during the resting years.

MEADOWS (Average annual rainfall, 35.52in.).

April 24th.—Present: nine members.

ONION-GROWING.—Under this heading, a paper was read by Mr. F. Wright. In dealing with the question of planting, he said the seed could be sown in April, and the seedlings transplanted, or the seed could be put in in August on the land that was to carry the crop. First of all one should obtain seed that was true to name. The Brown Spanish were the best, because they were splendid keepers; Yellow Globe and Yellow Damsel were also good. When sowing the seed for transplanting a piece of ground fairly high up, and facing the north or east, should be selected in order that the plants would be sheltered from the rough weather. The land should be covered with stable manure. That should be dug in, and the seed sown not later than the end of April in rows about 9in. apart. When they were up high enough to see they should be hoed and kept free from weeds until transplanted. When the plants were a foot high they could be planted out. He would not plant them before August, as they were apt to grow too quickly and go to seed. When planting it was a good plan to cut off a little from the tops, as that enabled them to root more quickly. A rich, loamy soil was the best for onions. The land should be ploughed to a depth of 9in. or 10in., and worked down to a fine tilth as smooth as possible. Farmyard manure gave the best results, as it kept the soil nice and loose. If bonedust were used he would sow it at the rate of from 10cwt. to 12cwt. to the acre. After the onions had obtained a good hold in the ground they should be hoed, and that operation repeated a few weeks later to kill all young weeds. It was not advisable to water the onions when they were growing if they could do without it. When the tops died off they were ready to pull, and should then be laid in rows to dry with the tops upwards to protect them from the hot sun until they were dry enough to cart. When carting them it was important to see that they were stored in a dry place with plenty of air. It did not matter how thick they were laid, so long as they were dry. On no account should they be stored away wet or damp, or decomposition would set in. If onions were properly treated, and received seasonable rains, they should return from 10 to 15 tons per acre.

MILANG.

March 9th.—Present: 41 members.

MANURING PASTURE LANDS.—Mr. J. M. Yelland, in the opening remarks of a paper on this subject, said there was practically no official record of any manurial tests for the manuring of pastoral lands in South Australia, neither were there any data whereby an inquirer could get information, even of an elementary nature. Innumerable tests were constantly being taken of manurial experiments with hay and grain, and he thought the same should apply to the manuring of pasture lands. The average farmer might say, and to a certain extent he was justified, that stock returned to the soil more than they took out of it. That, however, was not always the case. On land that had been grazed continually by one class of animal the pasture seemed to deteriorate, and a change of stock, such as cattle to sheep, or *vice versa*, tended to improve the land. But there were small holdings devoted to the dairying industry, and it would not be practicable for the man so engaged to pasture sheep on his land. He was well aware that pasture lands needed an occasional stirring up, either with the drill or the cultivator, but he was of the opinion that that plan had a tendency to destroy a large quantity of natural grass seeds. In fact it would take two or three years to get back the same crop of natural grasses.

if cereals were grown. The only method whereby the grass yield could be increased was to adopt a method of fertilizing. There were two kinds of manuring which the farmer could adopt, namely, farmyard manure or artificial manures. The first was a costly, clumsy method of increasing the fertility of the soil. The value of that class of manure lay in the large quantity of humus added to the land, and also in that it carried a considerable proportion of the chief elements of fertility. The second method of manuring pasture lands, and the one usually adopted, was artificial fertilization. That method was by far the easiest, quickest, and cheapest. The only difficulty the farmer had to contend with was the kind of fertilizer to use. The principal kinds, and those easily procurable were superphosphates, basic slag, bonedust, nitrate of soda, and sulphate of potash, and of these he favored superphosphate. The best method of application was either by a manure distributor or by an ordinary drill. The drill was preferable, as the distributor lost a lot on windy days. In a letter from Mr. W. J. Spafford (Superintendent of Experiments) he says:—“If I were manuring grass land in your district I would use 2cwts. of superphosphate and 1cwt. of basic slag or bonedust to the acre about March, and ½cwt. to 1cwt. nitrate of soda in August or September. Basic slag is proved, practically the world over, as the best grass manure, increasing both quantity and quality of the herbage, but in Australia it is too dear in comparison with other phosphates, and so I would make super. predominate in a mixture of the two. Nitrate of soda encourages growth, but it also encourages the ranker grasses. In any case it does not give the increases in Australia that it does in long-worked soils, and in heavy rainfall countries. Personally I would rather be inclined to cut out the very expensive nitrate of soda and increase the phosphates to 5cwts. per acre. If you use nitrate of soda alone, one application is all that is necessary, providing it is put on in the early spring. For an experiment put a strip along the nitrate plot of super. to the same money value per acre. For instance, if you use ½cwt. nitrate of soda per acre, and can get it for 15s. per cwt., put on one acre 7s. 6d. worth of super. Even though the super. be put on in spring instead of autumn, I believe it will outclass the nitrate. Autumn is the time to apply basic slag, not spring. In Australia, with our new soils and warm weather conditions (favoring nitrification), nitrogen proves profitable only with very few plants; phosphates are always needed, particularly by the grass family.” From the information supplied by Mr. Spafford it would be seen that he based the manurial experiments on phosphates. The question was whether the manuring of pasture lands would prove a profitable investment for the grazier. With superphosphates at 5s. per cwt., and nitrate of soda at 15s. per cwt., it would appear that at least 10s. worth of manure would have to be applied annually to be of much benefit. If the carrying capacity of the land could be increased by, say, 50 per cent., it hardly seemed a favorable return for the extra outlay. Still it should be remembered that after two or three applications the carrying capacity of the land would be considerably increased. Where a farmer could plough his grazing land he should do so, and add as much super. as he could afford. Several manurial experiments on grass were undertaken at Naracoorte with varied success. The plots were first treated on May 18th, then the manures were just drilled on top of the grass land, and then harrowed once. That was all the cultivation they received. No stock was allowed on them until the growing period was over, when they were fed off by sheep and cattle. The next year the stock were kept off until July 1st, until the growing period was over. Then the plots were fed off again. They were similarly treated the third year. The plot that was treated with a complete manure (2cwts. mineral super., 1cwt. nitrate of soda, and 1cwt. sulphate of potash) gave the best results for the first two seasons, whereas the plot treated with 2cwts. mineral super. alone gave the better results for the third year. The plot treated with mineral super. 2cwts., and nitrate of soda 1cwt., in no year gave results as good as the plot treated with mineral super. and sulphate of potash. One cwt. of nitrate of soda was used on one plot, and 1cwt. sulphate of potash on another, with the result that the sulphate of potash gave the better return. According to those tests a good liberal dressing of phosphates seemed to be the only fertilizer that would give any remunerative results, especially as the leaching process was not so pronounced in these fertilizers as in many others. In conclusion, it would be found necessary to be very cautious in the application of artificial fertilizers. The principal classes were phosphatic, nitrogenous, and potassic. Phosphatic manures consisted chiefly of superphosphate, basic slag, bonedust, and phosphatic guanos. Nitrogenous manures were represented

by nitrate of soda, sulphate of ammonia, nitrate of lime, nitroleum, and blood manures, while potassic manures consisted principally of sulphate of potash, muriate of potash, and kainit. Nitrogenous manures were quick acting, and took the form of a stimulant; hence they were generally sown late in the winter or early spring. Potassic manures should be sown likewise, while phosphates should be sown in the autumn. Phosphatic manures should be drilled into the soil, as they were a root fertilizer, while nitrogenous manures, which assisted the plant in taking its nourishment from the air, should be sown on top; therefore it was advisable to sow the phosphates in autumn and nitrogenous and potassic manures in spring.

MILANG.

April 20th.—Present: 30 members.

CROP ROTATION.—A paper on this question was contributed by Mr. C. W. Ness. A lengthy discussion followed. A meeting was also held on May 9th, when the evening was devoted to the discussion of the "Ailments of Stock."

PORT ELLIOT (Average annual rainfall, 20.33in.).

April 20th.—Present: seven members.

REPATRIATION.—Mr. H. Smith contributed a paper on this subject. It was thought by some, he said, that the scheme for settling returned soldiers on the timbered country of that district, and making orchardists out of them, would prove a failure. Some members argued that the returned soldiers would accept positions in the city with the high rate of wages now obtaining. Many rural workers had already gone to the city, where the work was not so laborious and the hours not so long. On all sides one heard that farmers were decreasing the area grown for wheat and going in for livestock. That meant less production and less wealth to the country. Money was at present very plentiful, but when the war ceased many of the industries would receive a setback. With that occurring many people in employment in the cities would be thrown out of work. His contention was that the man on the land would in the future be the best off, because most of the wealth was originally derived from the land. He considered that the scheme they had in view of making the returned soldiers orchardists would prove an admirable one, seeing that the climatic conditions were second to none in the State, with an easy access to the markets. Mr. Chibnall's paper on "Land for Returned Soldiers," that was read at the last meeting, was also discussed. Mr. H. Green tabled some excellent cobs of maize grown from American seed without irrigation since December.

URAILDA AND SUMMERTOWN (Average annual rainfall, 44.35in.).

March 4th.—Present: 10 members and one visitor.

UTILIZING THE HIGHLANDS.—Mr. J. Williamson, who contributed a paper on this subject, said those lands that were unsuitable for the growth of vegetables should be planted with either pine or eucalyptus trees. Two hundred pines could be planted on one acre of land at an expense of about £50; that amount would be sufficient to cover a period of 20 years, when each tree could be valued at £1 10s. That would show a net profit of £250. He had known pine trees to develop a diameter of 2ft. in 14 years. The highlands of that and the surrounding districts were most suitable for the growth of the eucalyptus. The distillation of the leaves from those trees was an industry that was increasing to a large extent in some of the States, and from the following figures (set out to cover a period of 20 years) it would be seen that the industry was one that would return good profits:—Cost of and clearing one acre of land, £20; seeds and planting, £5; gathering leaves at £5 per crop every two years, £50; distilling plant, £50; interest on same, £10; distilling of crop every two years, at £2 per crop, £20; total expenditure, £155. Eighty gallons of oil, at 4s. per gallon would be received from the crop every two years, equalling £40, or £400 taken from 10 crops, leaving a balance of £245, or a net profit of £12 5s. per acre each year. The expenses could be considerably reduced by several owners co-operating and purchasing the distilling plant. In the discussion that

followed; Mr. Hunt thought growing pine in the waste lands of the district would be a payable project. In future the scrub could be cleared and burnt, and judging from the growth of pines in various parts of the district he thought they would do well. Mr. Blackwell said that as timber would become dearer and the natural forests would be depleted, the growing of timber on the waste lands in that district should be a paying proposition.

ASHBOURNE, April 29th.—The Poultry Expert (Mr. D. F. Laurie) attended the Branch and delivered an address on "Poultry and the Marketing of Eggs."

CLARENDON, March 25th.—Mr. J. Potter addressed the meeting on the impressions that he had gained during a recent tour of the northern districts of the State.

CYGNET RIVER, May 23rd.—The President read an extract from the *Journal* on "The Care of Horses' Shoulders."

MACGILLIVRAY, April 24th.—The Hon. Secretary (Mr. H. E. Petras) read an extract from the *Journal of Agriculture*, and a good discussion followed.

STRATHALBYN, April 30th.—Mr. F. Abbott read a short paper on the question of the "Most Practical Method of Farming."

SOUTH-EAST DISTRICT.

COONAWARRA.

April 23rd.—Present: 14 members and three visitors.

Co-OPERATION.—A paper on this question was contributed by Mr. J. N. Bain, and a lengthy discussion followed. Mr. P. J. Lynch, delegate to the Naracoorte Conference, delivered a report of the proceedings.

GLENCOE (Average annual rainfall, 33.84in.).

January 24th.—Present: 10 members.

FARM BOOKKEEPING.—Mr. D. Cameron addressed the meeting on this subject. He had prepared a copy of a system of bookkeeping that he considered simple and suitable for farmers, and which would enable them to make up their income tax returns with less trouble than was usually the case. The Hon. Secretary (Mr. G. F. Ferguson) said that whatever system of bookkeeping was adopted it was necessary to enter up the various transactions punctually, and it was the neglect of that which caused errors and confusion. Mr. John Riddoch said that the heels of the cheque book served very well to record moneys expended. Mr. J. T. Halliday kept a day book and a ledger. He entered in the day book all transactions on the evening of the day on which each transaction was effected, and from that to the ledger at stated intervals, and by such a system there was no chance of mistakes. At a meeting held on February 21st a paper on "The Care of Horses' Shoulders" was contributed by Mr. A. von Duve. The speaker opened his remarks by stating that every horse should have a collar of its own. Hair-lined pipe collars were preferred, because, not only were they more comfortable for the horses, but there was also less likelihood of the horse choking. The following points, if observed, would in many cases prevent sores from forming on the shoulders:—See that the collar fitted well, rather on the tight side than the reverse. If a horse was inclined to be troubled with sores place a bran bag under the collar. Pull the hair of the mane out of the collar before commencing work. If the horses were doing heavy and laborious work, feed them on good strong feed, but not with too much uncrushed oats, as that overheated the blood. Young horses' shoulders were much inclined to chafe, but if watched closely and washed with cold, clean water after each day's work, very little trouble would be experienced. He had obviated a good deal of trouble by the use of the following mixture as an ointment for applying to sore shoulders:—Half a cup each of turpentine and vinegar, white of one egg, and half a bottle of either salad or olive oil. In the discussion that followed, Mr. Bodey said the remedy for sore shoulders as recommended by Mr. von Duve was a very old one and a very good

one. Two socks sewn on the collar on either side of a sore often relieved the pressure, and allowed the sore to heal. He preferred leather-lined collars rather than check lined, as the leather could be oiled and kept pliable. A further advantage was that the leather did not absorb the sweat. Mr. J. Dow said that salt was a very good remedy for sore shoulders. Mr. F. A. Telfer said that prevention was better than cure. He always made a special point of grooming the horses' shoulders, because the grime and sweat caused irritation of the skin. The Hon. Secretary (Mr. G. F. Ferguson) said that injudicious feeding often caused sore shoulders. If the feed was too rich it heated the blood and upset the system.

GLENCOE (Average annual rainfall, 33.84in.).

March 28th.—Present: 10 members.

BAD FLAVORS IN CHEESE.—Mr. L. Flett contributed a paper on this subject. All milk when drawn from the cow, he said, should be thoroughly cooled and placed in a clean can, and when kept overnight put out in the fresh air. Everything that came into contact with the milk, such as machines, buckets, and cans, should be thoroughly scalded with hot water. The practice of smoking whilst the milk was being prepared was one that should be avoided. Strong pasture and cows in bad health would also cause bad flavors. In discussing the paper Mr. J. Dow said that the cloths that were used for washing the cows' teats should be thoroughly boiled to prevent teat trouble being transmitted from one cow to another. Mr. T. Gratwick considered it most necessary to keep all sick animals away from the main herd, and to thoroughly disinfect all utensils used when attending to them. Mr. Flett said the bad milk from one cow would have a bad effect on the cheese. The curd would be spongy, and it would also be of a bad flavor. Mr. von Duve strongly disapproved the practice of raising milk to the required heat by the use of hot water, and also the addition of preservatives.

KYBYBOLITE (Average annual rainfall, 22.00in.).

April 21st.—Present: eight members and two visitors.

GRAIN VERSUS STOCK.—In a paper on this question Mr. A. H. Bradley said the enormous amount of wheat in the Commonwealth awaiting shipment, and the losses effected by mice and weevil raised a serious question, but the present harvest added to that surplus, and the likelihood of the war extending over another harvest made rather a gloomy prospect for the producers of grain. The large shortage in sheep and cattle caused through the recent drought could not be overcome by any other means than that of extensive breeding. These facts should entice farmers to double their efforts in the production of stock. On the average of the last 10 years, wheat-growing in that district had not proved altogether satisfactory, and another source of revenue should be adopted, namely, that of sheep-raising. The production of sheep and wheat were equally of importance to the nation, and it rested with the farmer to choose which of those two industries he could undertake to the best advantage. Under present conditions he preferred sheep-raising, because the prospects of marketing were more promising; hence a great opportunity presented itself to the man on the land. The rapid strides made in the breeding of the carcass of the sheep and the production of the wool had brought the industry close to perfection. It should be the aim of every farmer to establish on his farm that type of sheep that would be most profitable under the present conditions of stock-raising, and one that would at the same time meet the demands both for wool and mutton. It was a fatal mistake to import rams without personally supervising their selection, in order that the class of wool and frame of the body would meet the requirements of the ewes with which they were to be mated. There was another important factor in the building up of the flock. In that district where sheep did not do too well on natural grasses the farmer would have to resort to the growth of fodder grasses such as kale, pease, oats, &c. The carrying capacity of these fodders have proved themselves. With the aid of these fodders fat lambs could be produced. He did not recommend any particular type or breed of sheep for the farmer to keep. That was a point for the individual to decide upon. His object in writing the paper had been to urge upon members the necessity for a more definite and systematic method of sheep-breeding for that district.

KYBYBOLITE (Average annual rainfall, 22in.).

April 25th.—Present: 15 members and one visitor.

TAILING LAMBS.—Mr. C. H. Scholz, who contributed a paper on this question, said one often heard the expression that lambs could not be tailed too young. He did not think they should be marked until they were at least three months old. The weather was then more settled and warmer, and the lambs were, as a rule, in good condition to stand the operation. There were two ways of tailing the lamb that he was conversant with, namely, the knife and the searing iron. He spoke in favor of the former method, because it made a clean wound, which healed quickly. Care should be taken to see that the knife was sharp, and to disinfect it after each lamb had been marked. He admitted that the searing iron surmounted that difficulty, but the wound took considerably longer to heal. One of the most important features of the operation was the length at which the tail should be cut. He had come to the conclusion that the tail should be 1in. long for the ewes, and about 3in. for the wethers. If one cut the ewes' tails at the first joint, and the wethers at the third, that would make them just about the right length. He had found from experiment that if the tails of the ewes were left too long, they would in all probability fail to get in lamb. Mr. Schinckel, in discussing the paper, agreed with the writer, but he was of the opinion that if the lambs were tailed when the weather was mild the losses would be minimised.

LUCINDALE (Average annual rainfall, 23.32in.).

April 20th.—Present: 12 members.

"DOES IT PAY TO GROW GREEN FEED FOR LAMBS?"—This was the title of a paper contributed by Mr. J. McInnes. He considered that the raising of stock should take first place on the farm in that portion of the South-East. He was of the opinion that the ewe and lamb were the most profitable stock to keep, and as he believed in lambing at different periods of the year, it would be necessary to sow suitable fodders. For early green feed he favored rye and barley, drilled in about the end of February with 1cwt. of super. Should early autumn rains fall, the rye would grow first, and would be fit to graze about six weeks later. Barley was of slower growth, but the more nutritious food, and would come along later, and should be at its best about June and July, just at that time when the natural grasses in the pastures were very scarce. An early lamb, if forced along through the winter months, would be profitable at shearing time, as an early and well-grown lamb should cut from 5lbs. to 6lbs. of wool, and being fit to wean early, would allow the ewe to benefit by the spring grasses. The August lamb would have plenty of feed in the grass paddocks at lambing time, but would feel the pinch later, in the dry summer months. For the second lambing he favored rape, millet, and thousand-headed kale, sown in September with about 50lbs. of super. The cost of labor, &c., for putting in the fodder would not be very great, as the farmer had to keep a team of horses and implements for general use. A man with four horses and a three-furrow plough could easily plough four acres a day, and sow with a drill from 10 acres to 12 acres, so that it would not take long to put in a fair-sized paddock. The seed was grown on the farm, so that the only real out-of-pocket expense was the manure, which would cost about 5s. per acre. Should the season be favorable, with fair rains, a paddock of green feed should easily carry from two to three ewes and lambs to the acre, whereas the same land, uncultivated, would take about two acres to keep one ewe and lamb. In the discussion that followed, Mr. P. Burke said he had tried rye and oats two years ago. Both were sown at the same time, and the oats were very much ahead of the rye. In reply to a question, Mr. McInnes said the early lambs cut on average 6lbs. Odd ones had cut up to 9lbs. The early lambs were dropped at the end of April, and were fed on a barley patch right through. They were pure Merino. The three lambs exhibited by him at the show last year weighed 86lbs., 91lbs., and 94lbs. live weight, and cut 6lbs., 8lbs., and 9lbs. of wool shorn in November. Mr. P. Dow thought it was a good idea to grow feed for lambs, but he was of the opinion that it would pay better to grow oats and barley, and strip it and feed it to the sheep through the winter. Mr. L. McInnes thought it was a better idea to let the sheep into the barley, and let them do the stripping. They would do much better, and save a good deal of labor. Mr. J. McInnes advised growing rape or kale for summer, and if stockowners grew more green feed they would not have sickly lambs and have to make use of drenches.

Mr. T. W. G. Secker stated that peas made a 'splendid sheep feed. Mr. J. Nosworthy asked the time to feed off peas. The Hon. Secretary (Mr. W. Secker) stated that around Nairne and in the Hills, where peas were grown for fattening sheep, they were allowed to get ripe before the sheep were put on them. In reply to a question, Mr. J. McInnes stated that rye germinated with much less rain than barley, and would grow a better coat of feed on poorer ground. It would stand a dry spell better than any other grain. To obtain the best results from a green feed patch one should have it open to a grass paddock. The sheep did better if that were done, and it helped to save the green feed. By forcing a lamb on whilst young, it would make a bigger and better sheep. Mr. G. W. Langberg agreed that it paid to grow green feed for lambs. He had grown barley with rape and chow moultrie; that was sown in December in swamp country. It was ploughed, sown, and rolled, and in six weeks was fit to feed off. The swamps were ideal for raising lambs. Previous to cultivation his swamps would not carry one sheep to 20 acres, and now it would carry one sheep to one acre. Mr. Cotell asked if any members had grown Egyptian clover? Several members had tried it, but were of the opinion that the conditions in that district were not suitable.

MILLICENT (Average annual rainfall, 29.25in.).

March 9th.—Present: six members.

SUGAR BEET.—A discussion took place on this subject, and the class of land in the district considered most suitable for its growth. Mr. Hart was afraid of the heaviest class of land for beet, on account of the heavy rains in winter. Mr. Serle said that if thoroughly drained it might be suitable, but the trouble was to get the water off in time. He was this season trying sugar beet with and without water, and favored a mixture of peat and sand in preference to the heavy land on the flats, as he considered it would be too wet and sticky when the crop was ready to dig. Mr. Mullins was of the opinion that some of the black banks found on the flats would prove a suitable class of land for sugar beet, as that land was fairly dry in winter, and it worked well.

MILLICENT (Average annual rainfall, 29.25in.).

May 4th.—Present: 10 members and two visitors.

PRUNING DEMONSTRATION.—Mr. H. Hart gave an instructive demonstration of pruning fruit trees. He demonstrated the fundamental principles of pruning the different varieties, and also addressed the meeting on the methods of planting trees. He emphasized the necessity for digging a large hole when planting in stiff soil, leaving the centre higher, in order to encourage the roots to spread, and the advisability of mixing sand with stiff land. The lecturer also replied to a number of questions.

MOUNT GAMBIER (Average annual rainfall, 32in.).

April 13th.—Present: 23 members.

BUSH FIRES: THEIR ORIGIN AND PREVENTION.—The Hon. J. Botterill, in the course of an address on this topic, said that bush fires were becoming year by year a more serious menace to the men on the land. They had had outbreaks this year that seriously threatened the whole settlement of Moorak. Numbers of fires were caused by pure thoughtlessness. Others he thought were caused by carelessness. People who owned scrub or rough land, and wanted to burn it off, set fire to it without taking proper precaution to see that the fire did not get beyond the bounds they wished to burn. They lit the fire, and in a season like this, when everything was so dry, and they had no rain in March, and no green grass on the fringes of such rough patches, the fire got out and the trouble began. The greatest danger was from those who desired to burn rough country of their own. There was on the Statute Book a Bush Fires Prevention Act, and under that Act very large powers were given for dealing with the raisers of bush fires, and he thought

the time had arrived when some more stringent measures should be taken to enforce the provisions of that Act. He was not then prepared to say what ought to be done, but he thought members would agree that something should be done to enforce that Act, and make people liable for neglecting to take the precautions the Act laid down. The penalty was a very heavy one, and he was hopeful that the authorities would do something to have the Act more rigidly followed than before. A good discussion followed, members unanimously agreeing that more care should be exercised by people when burning scrub.

TATIARA (Average annual rainfall, 19in.).

April 13th.

TETANUS (LOCKJAW).—Mr. J. E. Pearce, in a paper dealing with this subject, said the disease was characterised by spasms of the various parts of the animal's body and limbs, and of the muscles supplied by the spinal cord. The disease was caused by a bacillus, found in the soil, stable manure, and dust. The germ grew only in the absence of oxygen, and set up a powerful poison that caused the disease. Deep wounds infected by the germ were more dangerous than those of a smaller nature, because the germ was more remote from the oxygen in the air. In most cases the cause of the disease could be traced to wounds, especially those of the feet. It might also be produced by castration and cutting or docking of the tail. Excitable horses were more prone to the disease than those of a quiet disposition. Should the attack be an acute one the animal usually died between four and nine days. The first symptoms would be noticed in the difficulty the animal experienced in masticating its food. The muscles of the neck and spine might become rigid and the animal would move in a stiff manner. Tetanus in sheep was also very destructive. The cuts on the body caused when shearing allowed the germ to enter into the blood, and cause the death of the animals. Preventive measures should be adopted after tailing and marking the lambs. Stockholm tar eight parts and coal tar one part should be applied to the wound. When the testicles had been removed a solution composed of glycerine and water equal parts, and turpentine and carbolic acid should be smeared over the purse. He pointed out that it was advisable to have the services of a professional man to prepare the above mixture.

FRANCES, March 3rd.—Mr. J. C. Brown read a paper on "Takeall," and the question of poisoning of foxes was well discussed.

